Dr. Gurcharn Singh Brar

Dr. Muhammad Iqbal

WELCOME!

We are the Cereal Breeding Lab (CBL)! Our research fields are at the Edmonton Research Station located in the heart of the city on the University of Alberta's South Campus in Edmonton, Alberta, Canada.

The University of Alberta's Cereal Breeding Lab is led by Professor Dr. Gurcharn Singh Brar. We focus on wheat variety development for the wheat producers of the western Canadian Prairie provinces. The main breeding objectives are to develop wheat with improved grain yield, reduced plant height and lodging, early maturity, suitable end-use quality, and resistance to the five priority 1 diseases, including leaf, stem, and stripe rusts, common bunt, and Fusarium head blight (FHB), to maximize the profits of the wheat industry.

We use a combination of conventional (modified pedigree, single seed descent, shuttle breeding) and modern (doubled haploids, marker-assisted selection, genomic selection) techniques to speed up line development and improve the efficiency of selection in the varietal development process.

Over the last 15 years, we have developed 19 wheat varieties that meet the agronomic, disease resistance, and end-use quality requirements of wheat market classes grown in western Canada. Notably, we have developed two of the earliest maturing (Go Early, Parata) and one of the highest yielding (Alotta) wheat varieties in western Canada.

THE PROCESS OF VARIETY DEVELOPMENT

Varietal development begins with selecting two or more parents with desirable traits, followed by crossing the selected parents and subsequent generation advancement to obtain homozygous lines. Selection is practiced for plant type, plant height, maturity, and rust resistance in the early generations. At F6 to F7 and subsequent generations, yield trials are conducted for up to six years along with evaluation for disease resistance (rusts, bunt, and FHB) and end-use quality traits (grain protein, falling number, flour yield, flour ash, starch damage, water absorption, gluten strength, etc.). Selection decisions are made every year based on the above-mentioned traits and sometimes based on the presence of a particular gene of interest.

Registration support documents are submitted for lines that have been tested for three years in the registration trials and have fulfilled the minimum criteria to the Prairie recommending committee for wheat, rye, and triticale (PRCWRT). Cultivar description trial is conducted for the candidate variety recommended for registration by PRCWRT and the registration application is submitted to the Variety registration office (VRO) of the Canadian Food Inspection Agency (CFIA). Breeder seed is produced for the variety and handed over to seed companies for subsequent distribution to farmers.

THANK YOU!

University of Alberta

CWRC Canadian Wheat Research Coalition

Alberta Grains

RDAR Results Driven Agriculture Research

Manitoba Crop Alliance

SaskWheat Development Commission

NSERC CRSNG

B.C. Peace River Grain Industry Development Council

WGRF Advancing Agriculture through Research

Sustainable Canadian Agricultural Partnership

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Registered University of Alberta Wheat Varieties

Variety	Test #	Class *	Year Registered	Distributor	Yield % Brandon	Maturity +/- days Brandon	Height +/- cm Brandon	Lodging	Protein +/- unit Brandon	** Common Bunt	** Fusarium Head Blight	** Leaf Rust	** Stripe Rust	** Stem Rust
BRANDON		CHECK			100	Late	84 cm	Very Good	14.0 %	S	MR	R/MR	MR	R
	PT7007	CWRS			98.7	0.3	-3.3	Very Good	-0.2	I	I	R	R	R
	PT7008	CWRS			99.1	-0.1	-2.3	Very Good	-0.6	I	I	MR	R	R
	HY2149	CPSR			103.4	-1.0	-2.2	Very Good	-1.0	S	I	R	I	R
CBL Eema‡	BW5100	CWRS	2024		104.5	1.0	0.3	Very Good	0	R	MS	MR	R	R
CBL Abba‡	PT799	CWRS	2024		94.6	-1.5	0.9	Very Good	0.3	S	MR	R	R	R
Alotta	GP250	CWSP	2023	Secan	122	1.0	-3.0	Very Good	N/A	I	MS	R	R	R
Donalda	BW5065	CWRS	2021		98.7	-0.6	4.0	Good	0.5	MS	I	R	R	R
Redcliff	PT793	CWRS	2022		98	-2.0	4.0	Good	-0.3	MS	MR	I	I	R
UA Forefront	HY2082	CPSR	2021	Penwest Seeds	102	2.0	-2.0	Very Good	-1.1	I	MS	R	R	R
Jake	PT782	CWRS	2019	Canterra	94	-2.0	9.0	Fair	0.6	MR	MS	MR	R	R
Sheba	NH004	CWRS	2019	Penwest Seeds	96	-1.0	10	Good	-0.5	MR	I	R	R	R
Rednet	PT783	CWRS	2018	SeedNet	97	0	13	Fair	0.1	S	MR	R	R	R
Ellerslie	PT784	CWRS	2018	Secan	99	-1.0	6.0	Very Good	-0.2	S	I	MR	R	R
Tracker	PT785	CWRS	2018	Canterra	94	-2.0	6.0	Fair	0	S	I	R	R	R
Zealand	BW986	CWRS	2016	Lefsrud Seeds	93	-4.0	16	Fair	-0.1	MS	MS	R	MR	I
Go Early	PT769	CWRS	2015	Mastin Seeds	95	-4.5	15	Good	N/A	MR	I	MR	I	MR
Parata	PT772	CWRS	2015	Secan	87	-4.0	10	Fair	0.2	S	I	MR	MR	R
Thorsby	BW947	CWRS	2014	Canterra	92	-2.0	3.0	Good	-0.5	S	I	R	R	MR
Coleman	PT765	CWRS	2013	Lefsrud Seeds	90	-1.5	15	Poor	N/A	S	MR	R	MR	MR

NOTE: Varieties were not all trialed against each other or had the same checks so values were adjusted to be reflective of common checks relative to AAC Brandon

‡ Not officially registered

*** Class Designations:** **CWRS** = Canada Western Red Spring
CWSP = Canada Western Special Purpose
CPSR = Canada Prairie Spring Red

**** Disease Resistance:** **R** = Resistant
MR = Moderately resistant
I = Intermediate
MS = Moderately susceptible
S = Susceptible