



Highlights From Canola Rapeseed and Mustard Breeding Program (Brassica Breeding Program)

Kamal Khadka

Results of PNW Canola Variety Trials

Best Performing Spring Cultivars 2025

#	Anatone, WA	Davenport, WA	Dayton, WA	Rockford, WA	Bonnars Ferry, ID	Genesee, ID	Potlatch, ID	Grangeville ID
Rank	Cultivars	Cultivars	Cultivars	Cultivars	Cultivars	Cultivars	Cultivars	Cultivars
1	CP9221 TF	CP9221 TF	CS2600 CR-T	InVigor L330PC	InVigor LR354PC	InVigor L333PC	CP9978 TF	CS3300 TF
2	CS3300 TF	InVigor L340PC	CS3300 TF	InVigor L344PC	InVigor LR344PC	CP9221 TF	CS2600 CR-T	InVigor LR354PC
3	CS2600 CR-T	InVigor L354PC	CP9551 TF	InVigor L345PC	InVigor L333PC	InVigor LR344PC	InVigor LR344PC	InVigor L333PC
4	CS3200 TF	InVigor L344PC	DG 760 TM (TF)	CS2600 CR-T	CS3200 TF	CS3300 TF	NCC2504B (IMI)	RUB CL 0225 CL
5	CS3000 TF	CS2600 CR-T	InVigor L354PC	CS3300 TF	CP9978 TF	NCC2504B (IMI)	CP9221 TF	CS2600 CR-T

Best Performing Winter Cultivars 2025

	Cloverland, WA	Odessa, WA	Genesee, ID	Craigmont, ID	Moscow, ID
Rank	Cultivar	Cultivar	Cultivar	Cultivar	Cultivar
1	DK Sequel	Kicker	Clavier CL	CP1077	DK Exstorm
2	CP1077WC	Akilah	CP1077	Kicker	CP1077
3	Akilah	Mercedes	Kicker	Akilah	Akilah
4	Kicker	DK Exception	DK Exstorm	DK Exception	Kicker
5	Mercedes	CP1077	Phoenix	DK Sequel	Durola

Idaho Oilseed Commission Funded Project

Assessment of Efficacy of Nitrogen Fixing Microbes in Spring Canola

Tested Two Biological Products in 2025

Biological Trials: Products

Utrisha™ N 

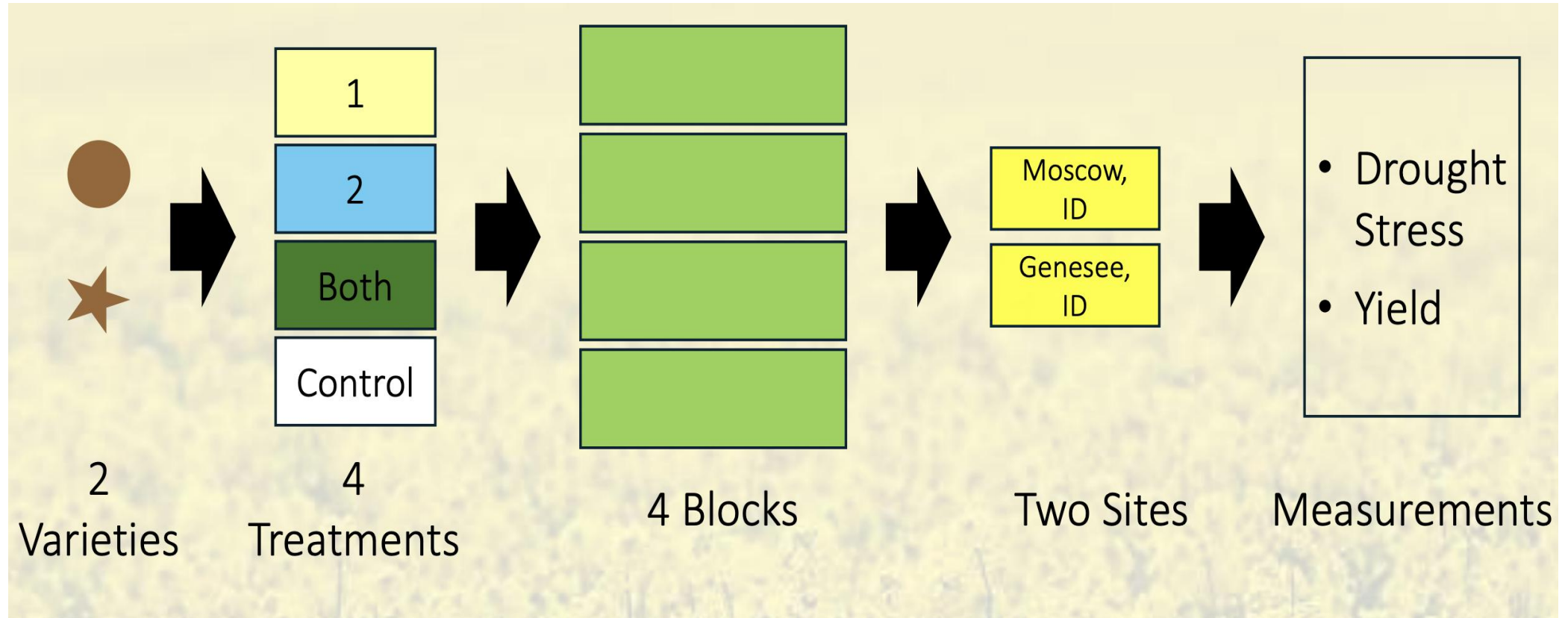
**CORTEVA™**
agriscience

- Foliar Spray
- Nitrogen Fixing Bacteria:
*Methylobacterium
symbioticum*
- Endophyte
- From arbuscular mycorrhiza

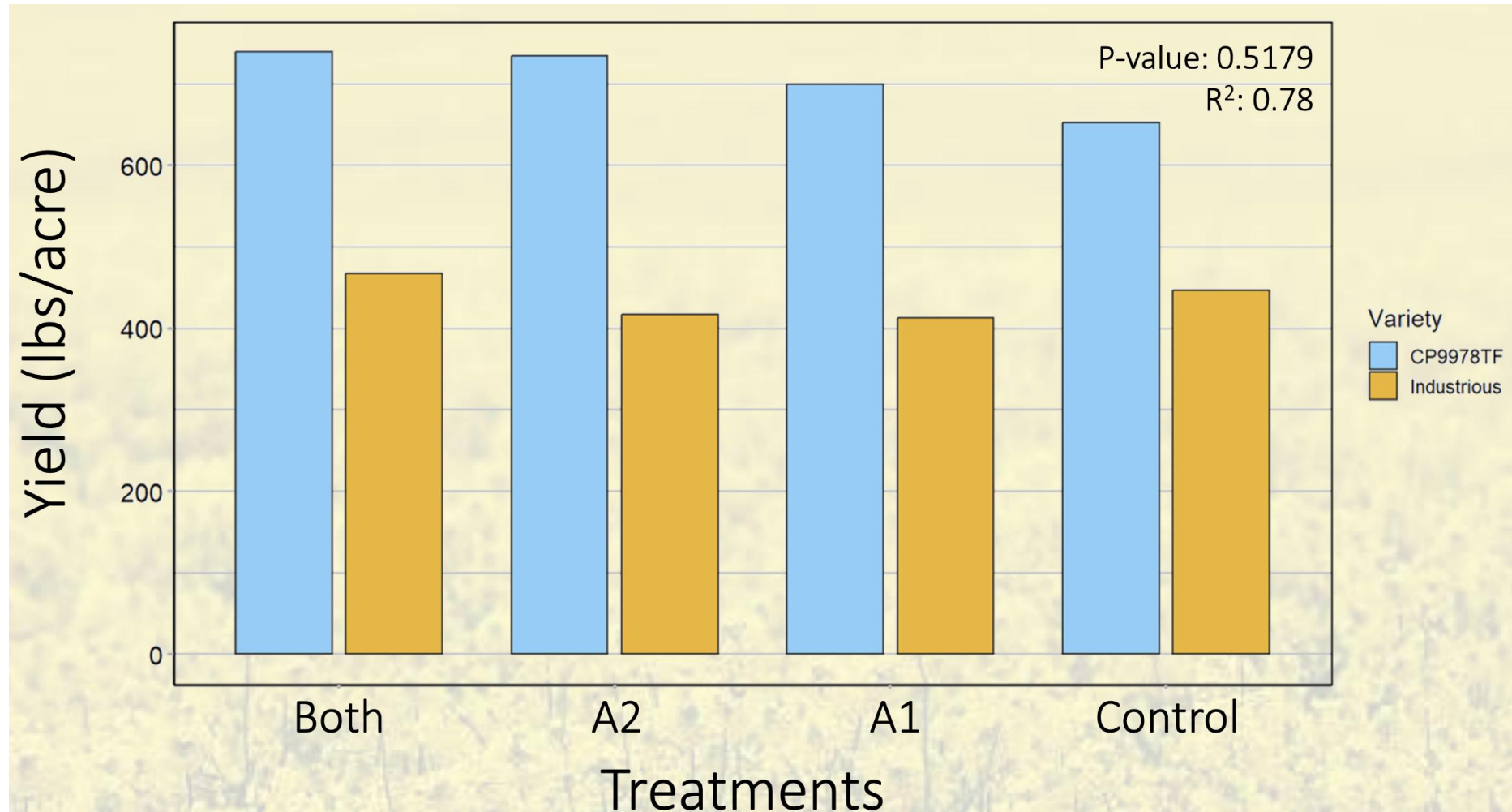
enovita®
 **Azotic®**

- Foliar Spray
- Nitrogen Fixing Bacteria:
*Gluconacetobacter
diazotrophicus*
- Endophyte
- From sugarcane

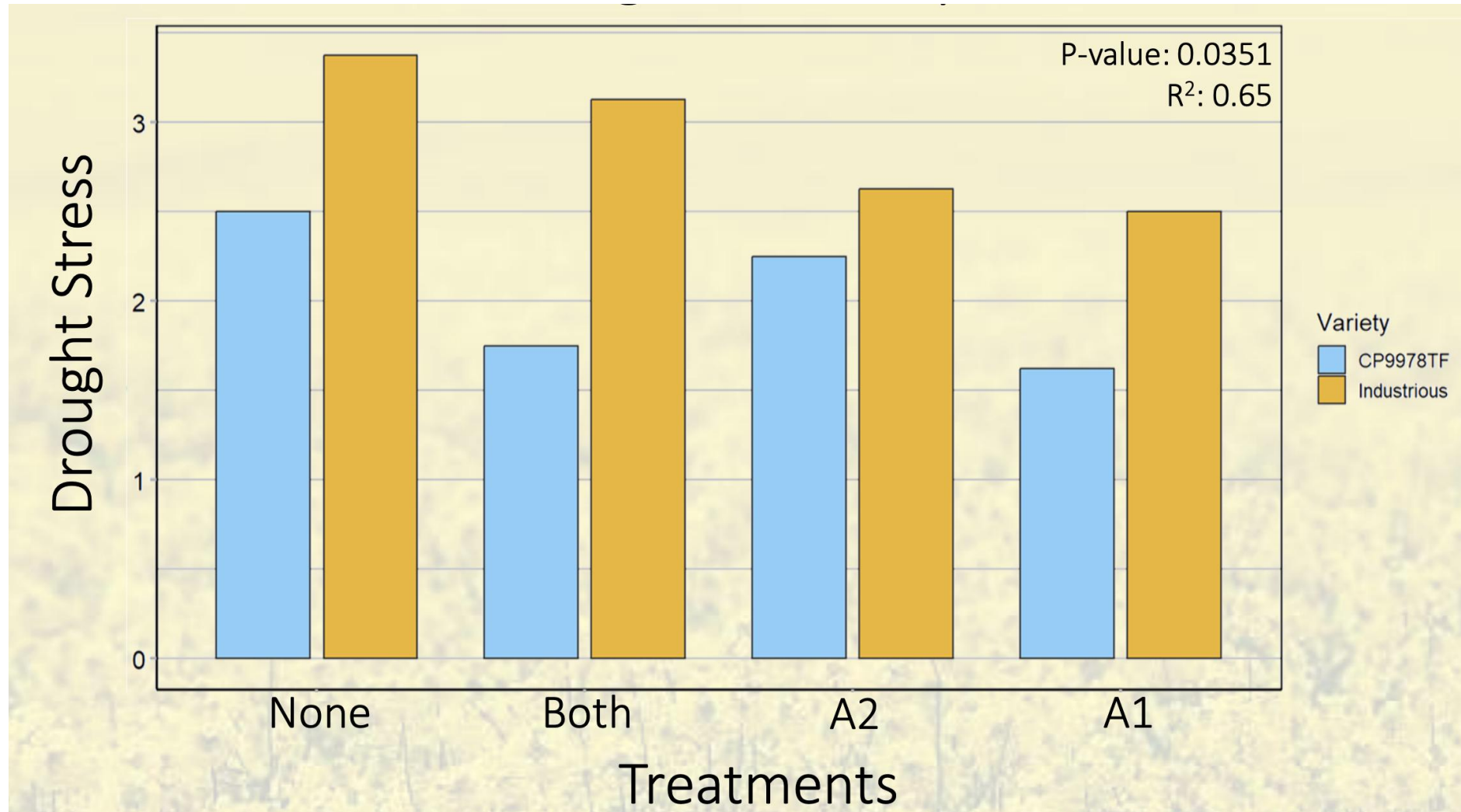
Trial Design for Both the Biologicals



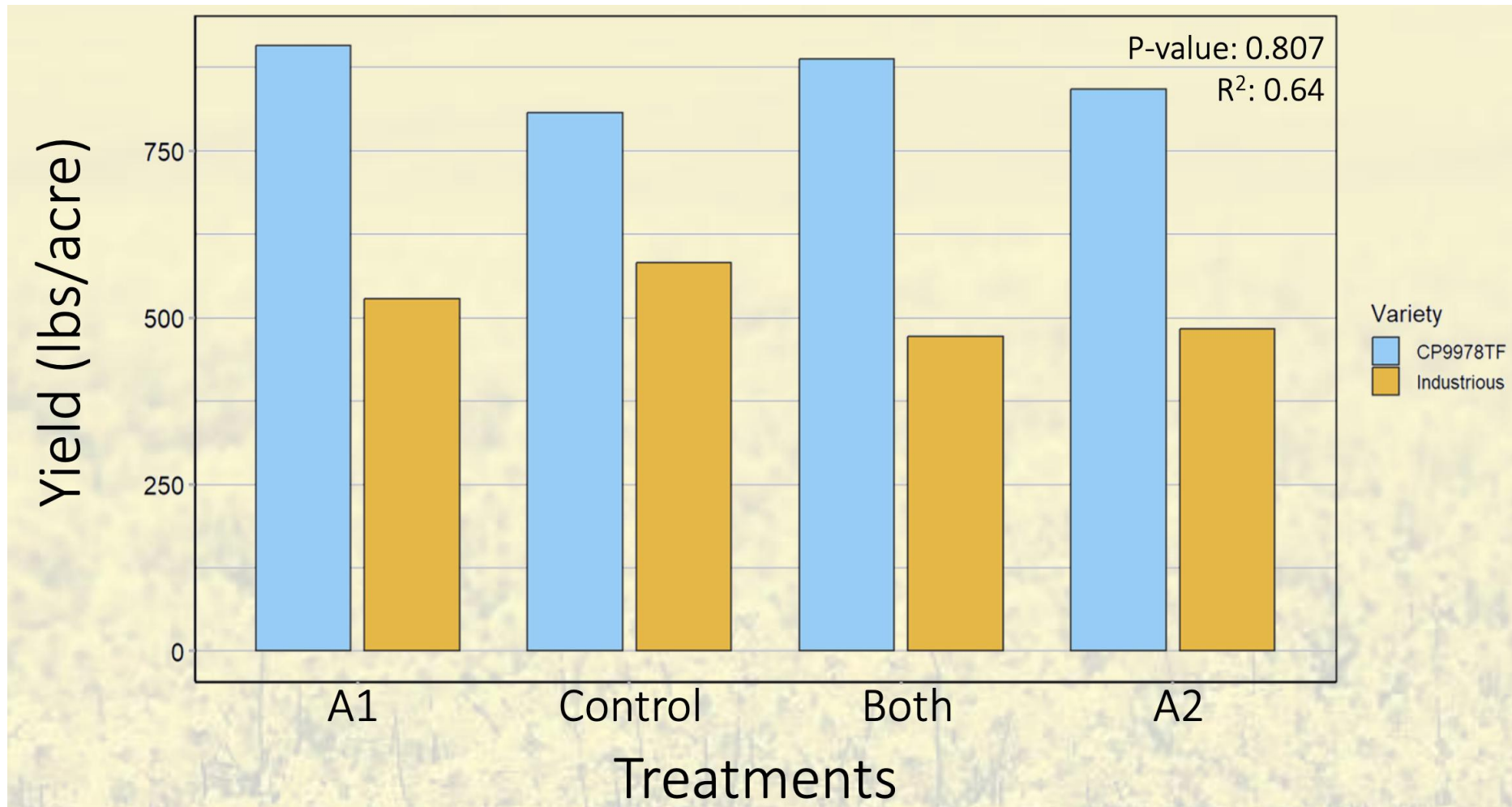
Utrisha-N Yield Treatment



Utrisha-N Drought Treatment



Envita Yield Treatment



Washington Oilseeds Commission Funded Project 1

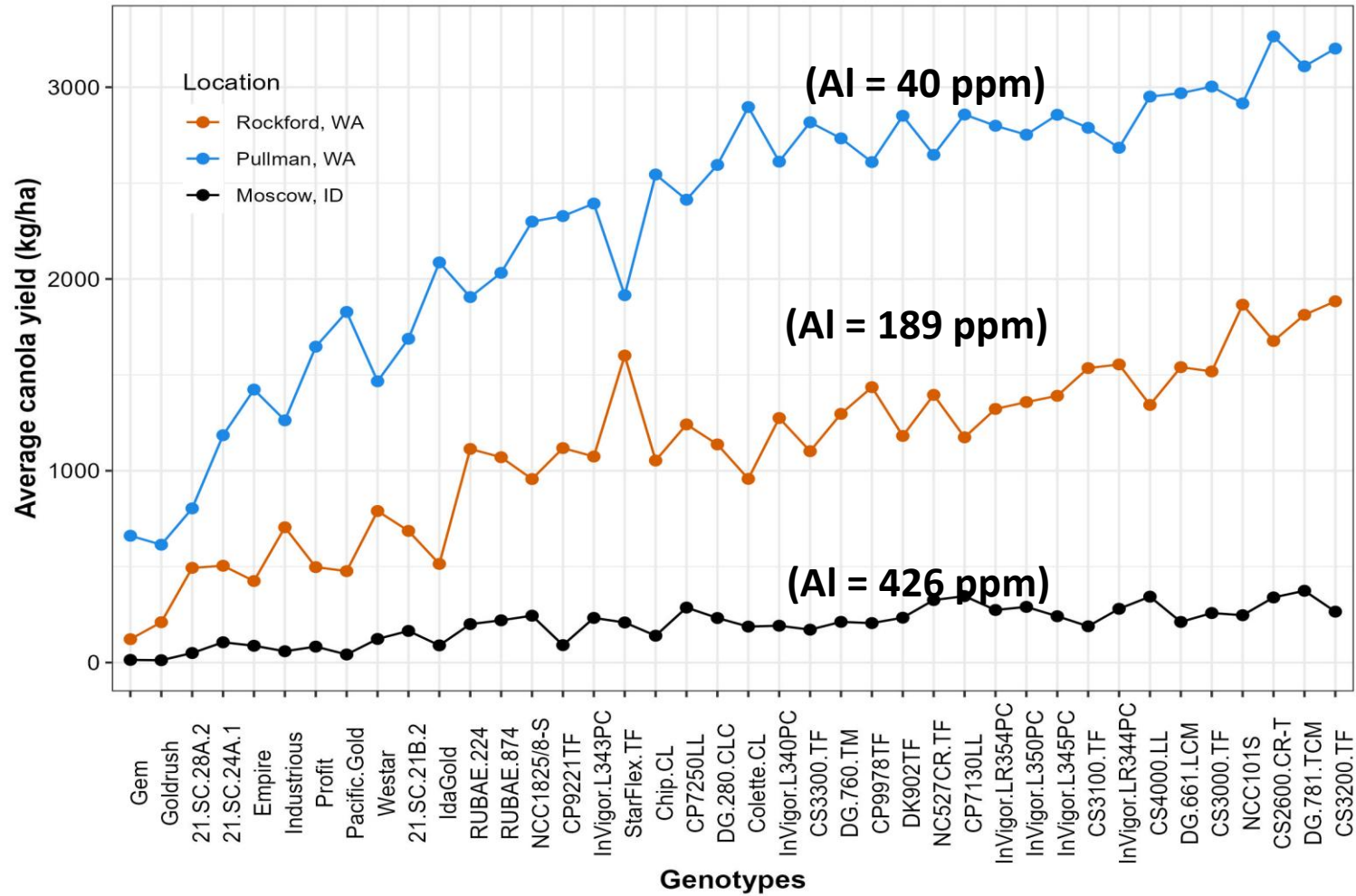
**Selecting Spring Canola Cultivars Adapted to Acidic
Soils in the Palouse**

Washington Oilseeds Commission supported project 1

- Evaluated 38 commercially available spring canola cultivars in three locations, in 2024
- Selected 18 lines evaluated under lime-amended and no-lime soil conditions in 2025

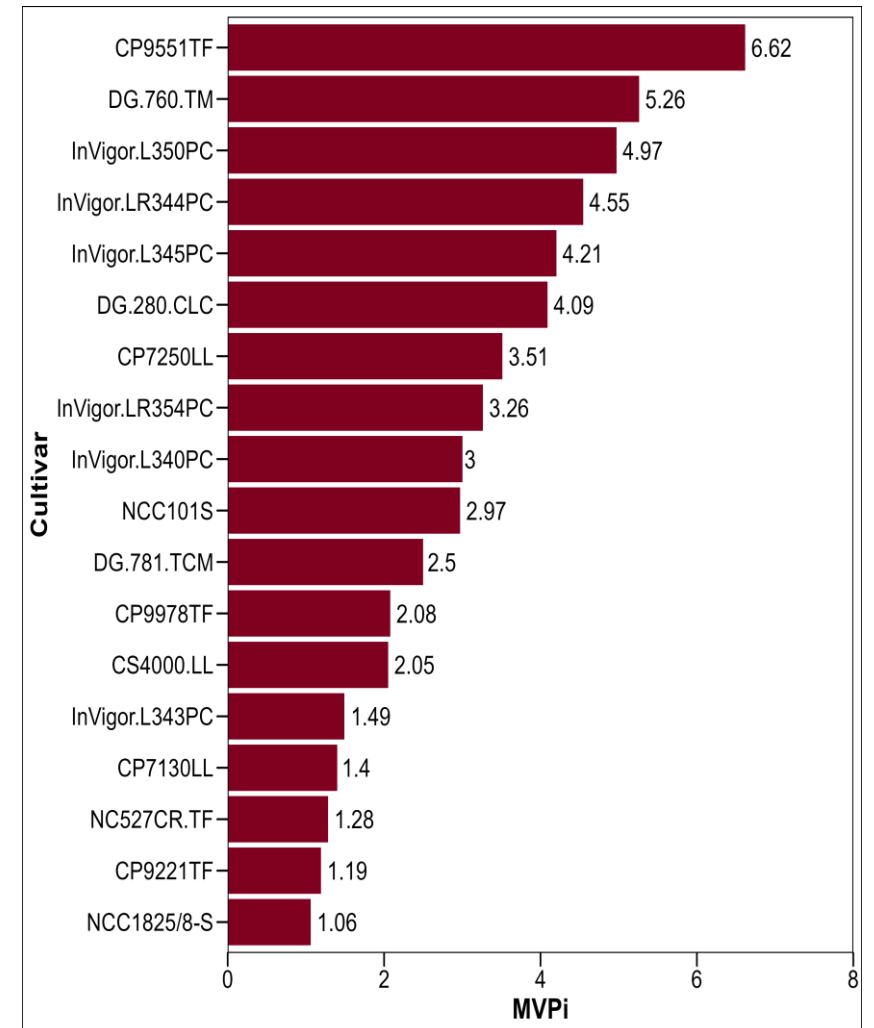
Experimental sites	Soil depth (inches)	pH	Al (ppm)
Moscow, ID	0-6	4.4	426
Rockford, WA	0-6	4.36	189
Pullman, WA	0-6	4.76	40

Al Concentration Key in Yield Reduction, 2024



Plastic Spring Canola Cultivars, 2025

➤ Assessment for multivariate plasticity showed cultivars like **CP9551TF** and **DG.760.TM** were highly plastic, performing well under favorable conditions, while **CP9221TF** and **NCC1825/8-S** exhibited low plasticity, indicating the stable performance across different soil pH conditions

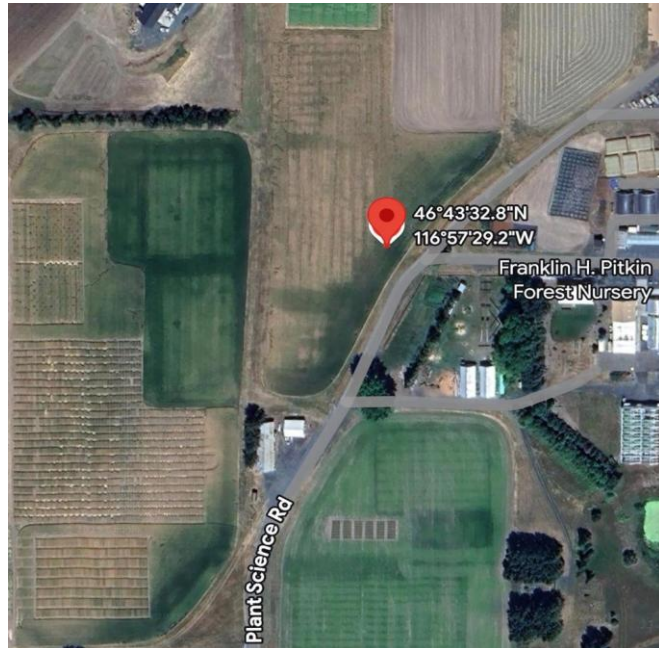


Washington Oilseeds Commission Funded Project 2

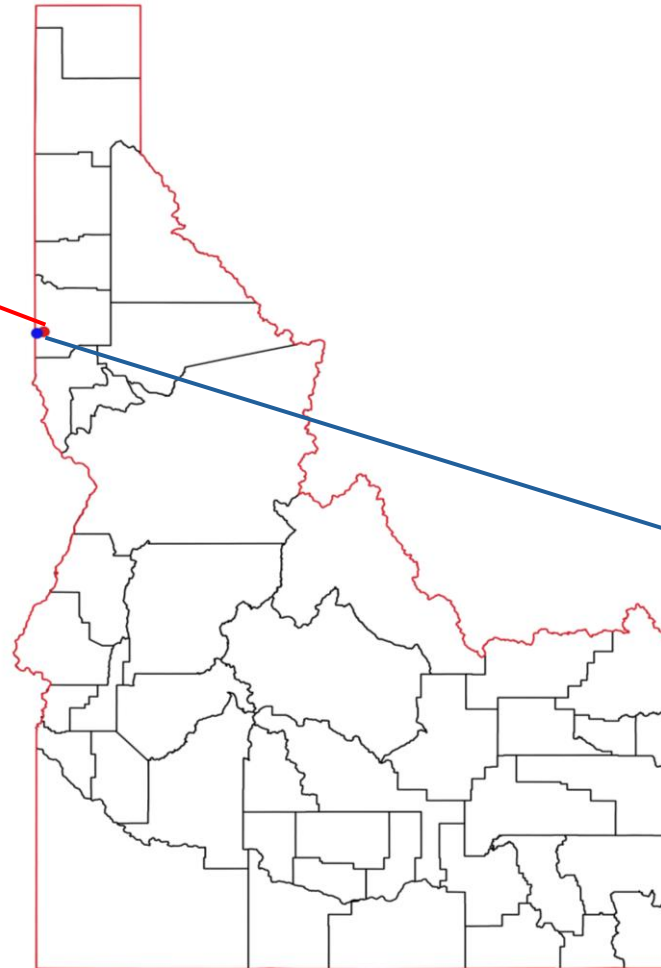
Insect Pests Monitoring in the PNW Canola

Assessment of Canola Crops to Flea Beetle Damage

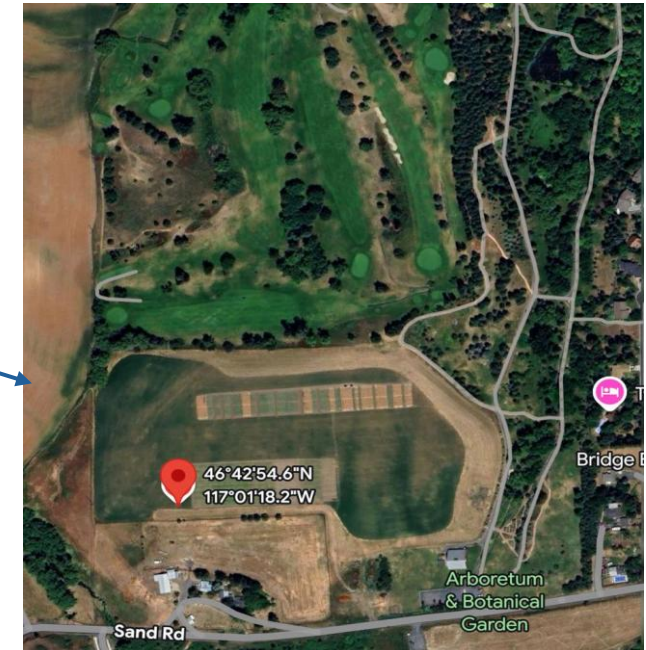
Research location 2024



Parker farm (Moscow, ID)
46°43'32.8"N -116°57'29.2"W



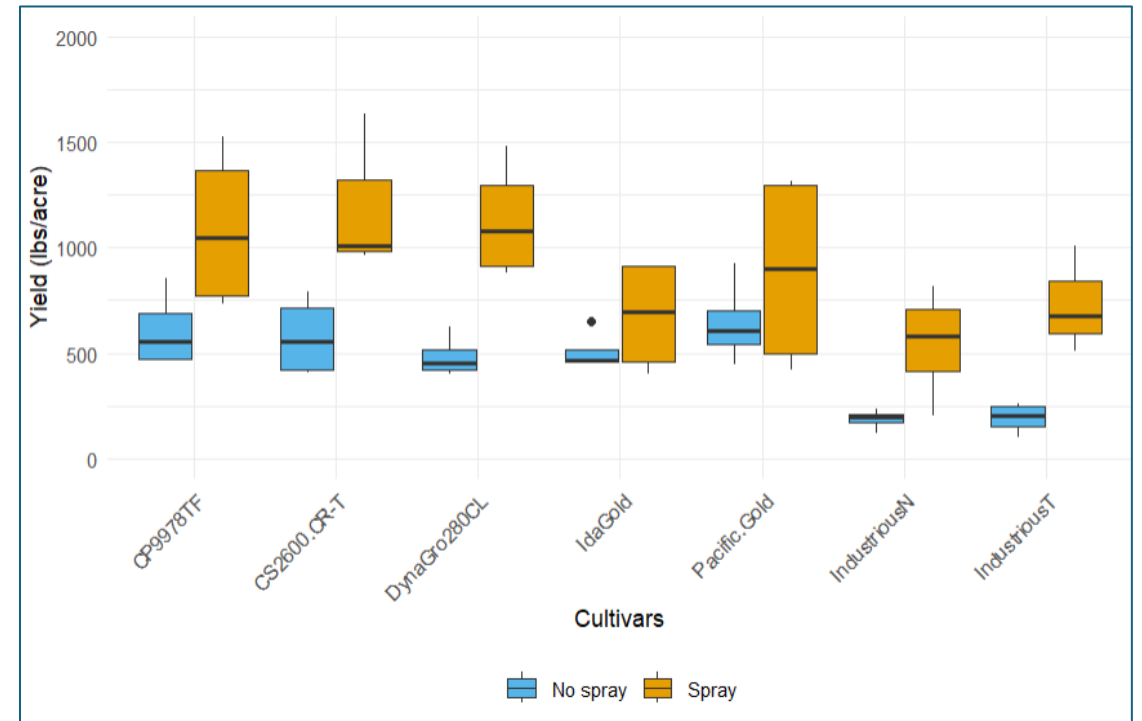
Research location 2025



Arboretum (Moscow, ID)
46°42'54.6"N -117°01'18.2"W

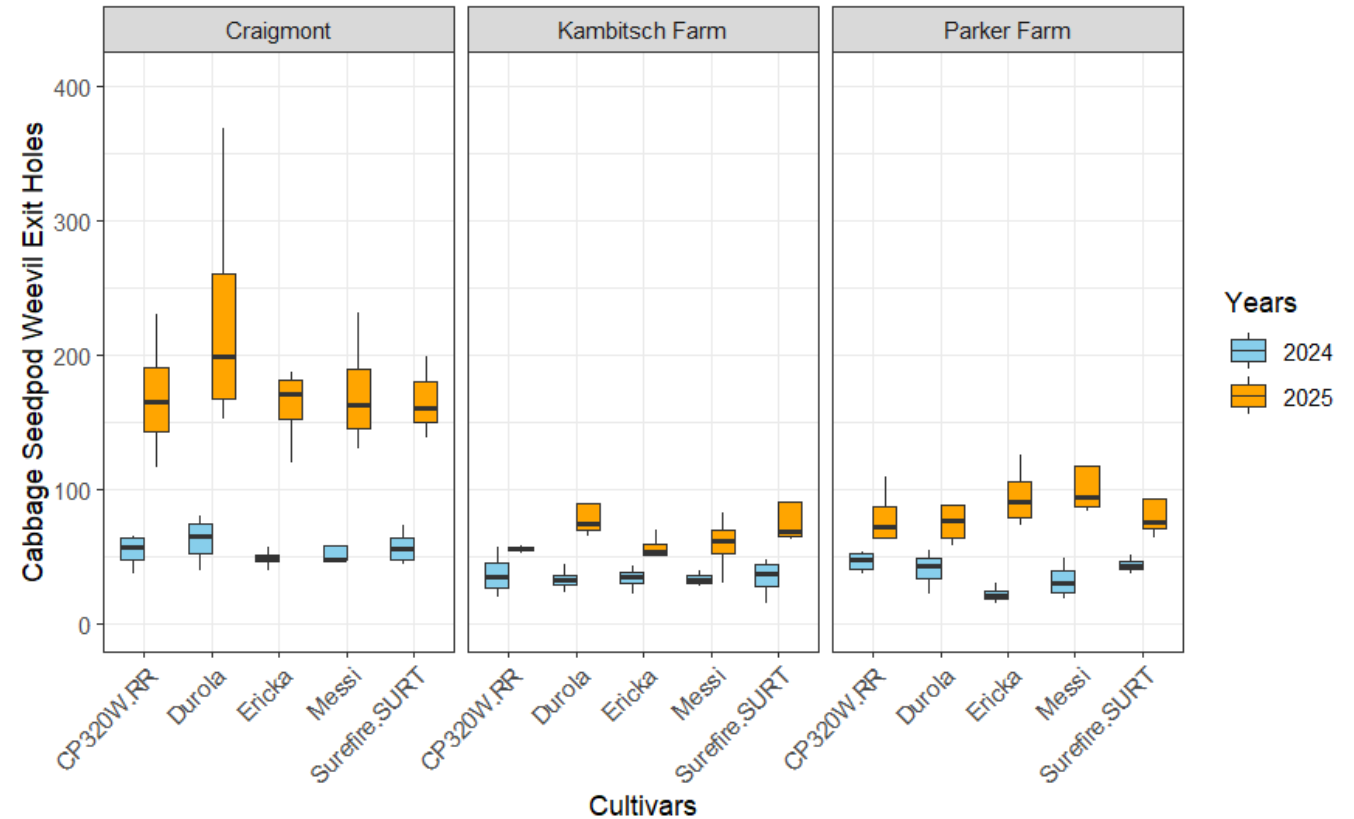
Response of Canola and Mustard Cultivars to Flea Beetle Damage

- Foliar spray generally increased yield compared to no spraying, however, yield response to spraying was cultivar dependent
- In general, combining seed treatment, foliar spray, and cultivars significantly reduced flea beetle damage

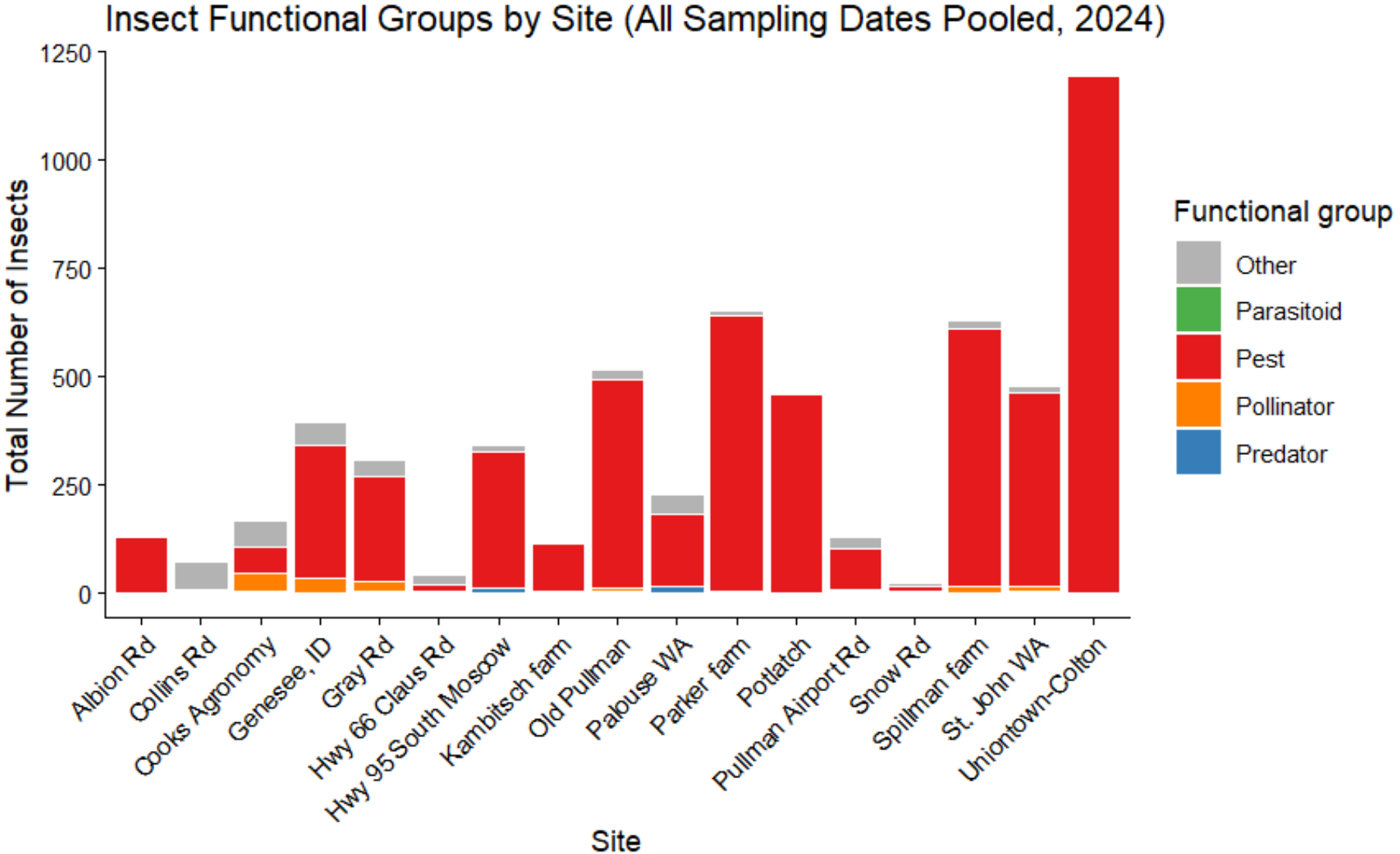


Cultivar Response to Cabbage Seedpod Weevil

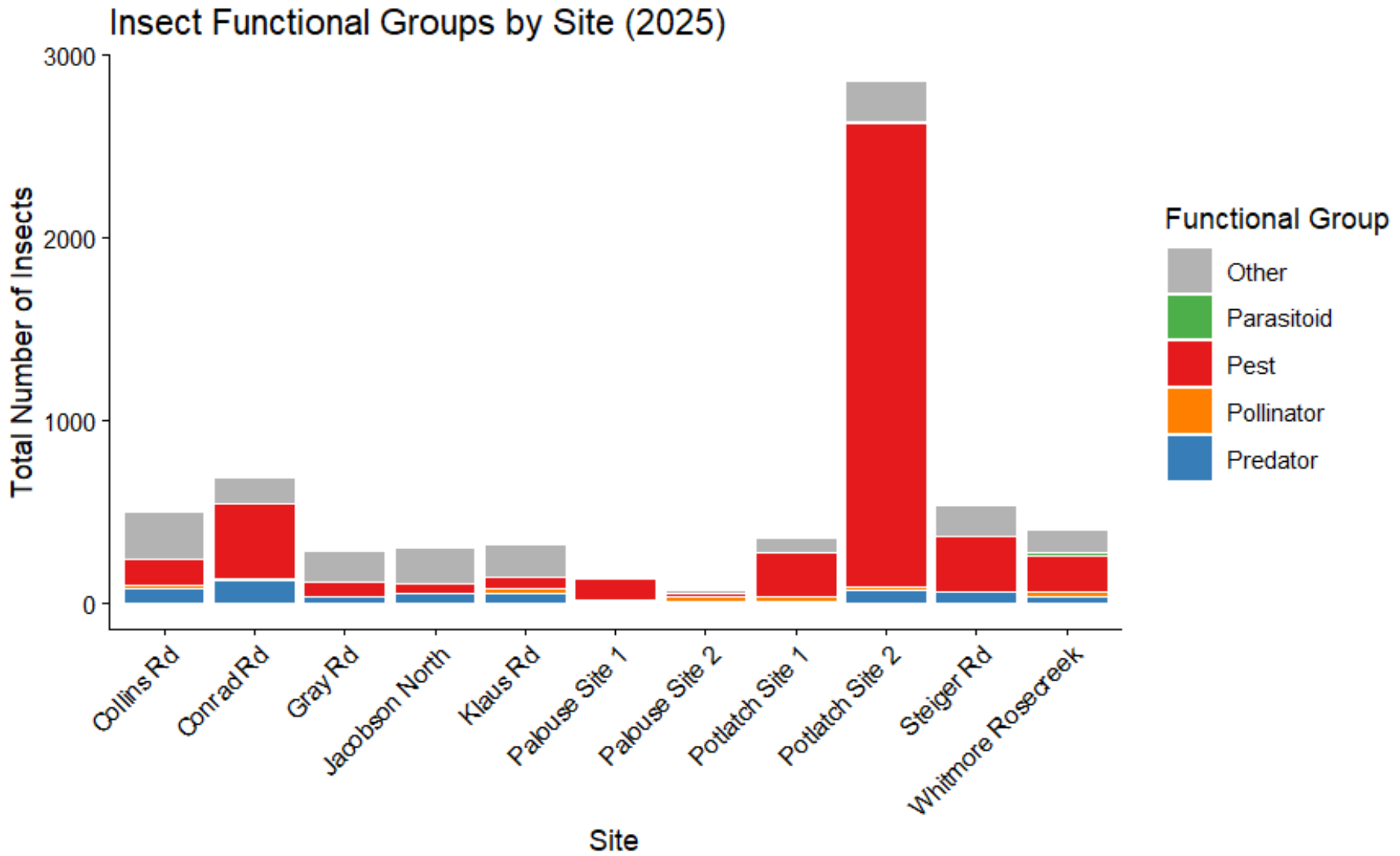
- No winter canola cultivars stood out as resistant
- Environmental factors could have influenced both damage and yield



Insect Functional Groups by Site, 2024



Insect Functional Groups by Site, 2025



Other Breeding Works and Achievements

Major Breeding Activities

- Winter and spring canola, mustard crosses
- Identification of winter hardy canola lines
- Acid tolerance in winter and spring canola
- Drought tolerance in spring canola
- Winter-hardy mustard breeding
- Quality traits in canola (e.g. high oleic acid)



Promising Winter Hardy Lines Selected

- **Two promising lines selected**
 - **16.WC.105.14.12** (ranked 13th in the PNW variety trials among 30)
 - **13WI.7.7.5.13** (ranked 10th)
- **Planning to propose these two lines for release ~ planning initiated**

Initial yield trials ~ new potential lines

- **41 lines** tested initial yield trials (IYT) in 2024-2025
- Highly promising winter canola line:
 - 21.WC.42A.1
 - 21.WC.36A.1
 - 21.WC.35B.1



21.WC.42A.1

Promising Spring Industrial Rapeseed Lines

#	Generation	Selected lines	Remarks
1	F7	21.SC.23A.1.4F6	Low glucosinolate, high erucic acid
2	F7	21.SC.23A.1.8F3	Low glucosinolate, high erucic acid
3	F7	21.SC.23A.1.8G10	Low glucosinolate, high erucic acid

Selection for High Oleic Acid in Spring Canola

- 22 lines were selected for high oleic acid and tested in the field during the summer of 2025
- Yield performance was not impressive
- New crosses planned for summer 2026

21.SC.25A1.4.1	High Oleic acid
21.SC.25A1.4.2	High Oleic acid
21.SC.25A1.4.3	High Oleic acid
21.SC.25A1.6.1	High Oleic acid
21.SC.25A1.6.2	High Oleic acid
21.SC.25A1.9.1	High Oleic acid
21.SC.25A1.9.2	High Oleic acid
21.SC.25A1.11.1	High Oleic acid
21.SC.25A1.11.2	High Oleic acid
21.SC.25A1.26.1	High Oleic acid
21.SC.25A1.26.2	High Oleic acid
21.SC.25A1.26.3	High Oleic acid
21.SC.25A1.34.1	High Oleic acid
21.SC.25A1.34.2	High Oleic acid
21.SC.25A1.36.1	High Oleic acid
21.SC.25A1.36.2	High Oleic acid
21.SC.25A1.46.1	High Oleic acid
21.SC.25A1.46.2	High Oleic acid
21.SC.25A1.46.3	High Oleic acid
21.SC.25A1.46.4	High Oleic acid

Mustard Breeding Objectives

- Development of high yielding and disease resistant **condiment mustard** cultivars
- Development mustards for bio-fumigation
- Develop winter mustard germplasm



Selections from the Crosses Made in 2020

- Four advanced breeding lines plus 20 individual plant selections derived from these materials were evaluated in the summer of 2025
- 20.BJ.164.YB has shown a great potential, higher yield than Pacific Gold, the top performing cultivar from the program

Genotypes	Yield (lb/acre)	
	Genesee	Moscow
20.BJ.164.YA	1162	1048
20.BJ.164.YB	1339	1020
20.BJ.17.B9	904	926
20.BJ.26.B1	873	631
Bruin	1042	933
IdaGold	1236	685
Kodiak	877	434
Pacific Gold	1111	926

Breeding Winter Hardy *B. juncea*

- Effort is going on to generate winter hardy mustard germplasm through interspecific crossing



Acknowledgements



All the grower cooperators

All the industry collaborators



Thank You