

Trial Report: Rutabaga 2022

Goal: The goal of this trial was to compare **open-pollinated rutabaga varieties** in **organic conditions** on **participant farms** in Alberta and BC.

Background: This is the third year of CANOVI rutabaga trials. In 2020 and 2021, trials were nationwide rather than focused on one region. The 2022 trial compared the **top six best performing varieties** of the **ten varieties trialed in 2021.**

Varieties: Participants planted 6 varieties: four purple-topped and two green-topped



Participants: 13

Variety	Туре	Days to maturity	Catalogue description link		
Helenor	Purple top	90	Helanor (Johnny's Selected Seeds)		
Joan	Purple top	N/A	Joan (Wild Garden Seeds)		
Laurentian	Purple top	N/A	Laurentian (Johnny's Selected Seeds)		
Nadmorska	Green top	85-100	Nadmorska (Siskiyou Seeds)		
Gilfeather	Green top	85	Gilfeather (Siskiyou Seeds)		
York	Purple top	115-120	York (Vesey's)		

Planting: Participants planted **12 linear feet per variety** at **approximately 4-6 plants per foot**, using single or multiple rows per bed. Seeds were **sown in June-July** for harvest in September-October. Participants used their usual organic methods for soil fertility and weed management.

Evaluation: Participants evaluated varieties using the desktop or mobile <u>SeedLinked</u> app. Germination, early vigour, uniformity, yield, marketability, appearance, disease resistance (focusing on Brassica clubroot), insect resistance (focusing on cabbage maggot), and flavour were rated on a scale of **1 (low) to 5 (high)**. **A rubric was provided** that defined the rating scale for each trait.

Results and analysis: Interactive plots were available on the SeedLinked website immediately after trial closure. In addition, CANOVI researchers performed **statistical analysis** and presented results in a **webinar** and in this **trial report**.

Please view the **2022 CANOVI Rutabaga Trial Protocol** for full instructions and the evaluation rubric.



Varieties by Overall Preference





Laurentian





York





GD .loan

Joan





58%

50%

C Nadmorska

C Heleno

G Gilfeather



Helenor



Nadmorska



- Laurentian was rated highly for germination*** and vigour **, and was above average for all traits.
- York was rated highly for germination***, appearance, uniformity, and vigour but lower for insect resistance.
- Joan scored lower for germination***, vigour **, and yield, but it was rated favourably for flavour and marketability.
- Gilfeather was rated highly for germination*** and insect resistance but was around average for other traits.
- Helenor was rated highly for germination*** and uniformity but slightly lower for flavour and yield.
- Nadmorska scored lower for germination***, marketability, and yield but highly for vigour **.
- Variety ranking and trait ratings varied substantially among 2020, 2021, and 2022 CANOVI trials, emphasizing the importance of trialing varieties for multiple years before relying on them for production.

Blue = Would grow again **Red** = Would <u>not</u> grow again Varieties are ordered by percent of participants who would grow the variety again

This research is part of <u>Organic Science Cluster 3</u>, led by the <u>Organic Federation of</u> <u>Canada</u> in collaboration with the <u>Organic Agriculture Centre of Canada at Dalhousie</u> <u>University</u>, supported by Agriculture and Agri-Food Canada's <u>Canadian Agricultural</u> <u>Partnership- AgriScience Program</u>, <u>The Bauta Family Initiative on Canadian Seed</u> <u>Security</u>, and the <u>Centre for Sustainable Food Systems at the UBC Farm</u>.

Trial data analysis and report by Dr. Solveig Hanson, CSFS at UBC Farm. For more information, please visit <u>seedsecurity.ca/en/302-canovi</u> or email <u>solveig.hanson@ubc.ca</u>.

THE BAUTA FAMILY INITIATIVE ON







Analytical Methods and Supporting Data: CANOVI Rutabaga Trial 2022

Trait ratings were analyzed by variety using a one-way mixed effects Analysis of Variance, controlling for random variation among participants. That is, we looked for significant differences in ratings among varieties.

All participants (n=13) were located in Alberta or BC, and most were in hardiness zones 2 or 3. Thus, there was not a reasonable way to divide participant data for analysis by region.



	Appearance	Disease Resistance	Flavor	Germination ***	Insect Resistance	Marketability	Uniformity	Vigor **	Yield
Gilfeather	3.0	4.3	3.6	4.1	3.7	2.9	3.1	3.6	3.8
Laurentian	3.4	4.5	3.7	4.6	3.5	3.1	3.3	4.3	3.8
York	3.2	4.2	3.2	3.8	2.9	2.9	3.2	3.9	3.2
Helenor	3.0	4.1	3.2	3.9	3.4	2.9	3.3	3.4	2.9
Nadmorska	2.8	4.1	3.3	2.7	3.2	2.8	2.9	4.0	2.9
Joan	3.0	3.9	3.7	2.3	3.1	3.3	3.0	2.9	2.6
	3.0	4.2	3.4	3.6	3.3	3.0	3.1	3.6	3.2

Mean Ratings by Variety

Means and significant variation by variety in 1-way mixed model ANOVA controlling for random variation among participants. Green = High rating; Yellow = Mid-range rating; Red = Low rating

- This trial found **strong variation among varieties** only for **germination***** **and vigour****.
- Mean scores for many traits hovered between 3 and 4, or "acceptable" and "good."
- Within this set of cultivars, there is **neither a standout variety nor a variety with particular problems**.

	P (<f)< th=""><th>Strength of evidence</th></f)<>	Strength of evidence
^	<0.10	Weak
*	<0.05	Moderate
**	<0.01	Strong
***	<0.001	Very strong

ANOVA and Pairwise Comparisons

Trait	SS	MS	NumDF	DenDF	F	Pr >F S	Sig
Appearance	2.14	0.43	5.00	39.99	0.44	0.82	
Disease_Resistance	1.78	0.36	5.00	30.94	0.77	0.58	
Flavor	1.78	0.36	5.00	34.28	0.31	0.90	
Germination	39.52	7.90	5.00	42.30	9.70	3.18E-06 *	***
Insect_Resistance	2.43	0.49	5.00	28.61	0.57	0.72	
Marketability	1.29	0.26	5.00	33.57	0.19	0.96	
Uniformity	1.41	0.28	5.00	34.62	0.26	0.93	
Vigor	12.13	2.43	5.00	40.15	4.53	2.29E-03 *	**
Yield	8.20	1.64	5.00	28.54	1.63	0.18	

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The following pages display barplots of mean ratings for each trait, with error bars showing +/-1 SE around the mean. Different letters denote a statistically significant difference in ratings between varieties at P < 0.10.













Variety mean ratings from 2022 CANOVI participants, controlling for variability among participants. Error bars show +/- 1 SE.





Joan

0

Gilfeather

Helenor

Nadmorska

York