

## RESEARCH REPORT 2023

**Project Title:** Processing Cucumber Variety Evaluation

**Prepared for:** Ontario Processing Vegetable Growers,  
Ontario Cucumber Research Committee

**Research Location:** Ontario Crops Research Centre - Simcoe  
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**Objective:** The objectives of these studies were to evaluate new cucumber varieties for yield performance, quality, adaptability and acceptability to North American processors for handpick and machine harvest applications. New superior yielding cucumber varieties are required to ensure that the industry can compete effectively. New varieties are being introduced by seed companies each year, therefore, variety evaluation is essential in order to recommend the best varieties to the industry. In particular, varieties that have local adaptability and market acceptance, together with higher yields, improved fresh quality, improved brining quality and better disease tolerance are needed.

**Methodology:** Three cucumber variety trials were conducted at the Ontario Crops Research Centre located in Simcoe, Ontario, in 2023: (1) Parthenocarpic Hand Harvest (multi-pick), (2) Conventional Machine Harvest (simulated once-over harvest) and (3) Parthenocarpic Machine Harvest (simulated once-over harvest).

Processing cucumber varieties were evaluated to compare how they perform under the same environmental conditions. Trials were set up as a randomized complete block design with three replications for the hand harvest trial and four replications for machine harvest trials. Commercial and experimental varieties were evaluated in all trials. Experimental varieties are not included in this report.

### *Hand Harvest Trials*

The parthenocarpic multi-pick variety trial included 10 commercial varieties for evaluation. The trial was seeded on May 31 using a standard cone seeder mounted on a John Deere planter. The plot size of the trials was 1.5 m (5 ft.) x 6 m (20 ft.). Plants were thinned to 15 cm (6") in row, giving a target plant population of 18,000 plants/acre. Cucumber plots were harvested two times per week, for 10 harvests from July 17 to August 18.

### *Machine Harvest Trials*

The conventional and parthenocarpic machine harvest trials both included 7 commercial varieties for evaluation. Trials were seeded on June 27 and June 13 for the conventional and parth machine harvest trials, respectively, using a standard cone seeder. The plot size for these trials were 0.75 m (2.5 ft.) x 6 m (20 ft.). Plants were thinned to 10 cm (4") and 20 cm (8") for the conventional and parth trials, respectively, giving a plant population of 55,000 and 28,000 plants/acre. Cucumber plots were harvested as a simulated once-over destructive pick, where plants were pulled by hand, and all cucumbers harvested into bushels down to a 1A/B size. Varieties were harvested to target correct maturity and thus harvest date is dependent on the variety. For the conventional machine trial, the harvest day for varieties in this report was August 10 (44 DTH). For the parth machine trial, the harvest days were July 31 (48 DTH) and August 2 (50 DTH).

For all trials, the crop was grown according to accepted commercial practices used in Ontario. Yields were measured at harvest as fruit weights (ton/acre), graded out by size and dollar value per acre (Tables 1-3). Data was taken on fruit length to diameter ratios (LD) on a weekly basis for hand harvest and once for machine harvest. Evaluations on fresh internal quality and bitterness were taken after grading. Selected varieties from all trials were brined at Simcoe for evaluation by the industry October 24. LD, fresh internal, bitterness and brine data is not shown in this report, however is available by request.

#### **Results:**

Yields shown are for each graded size and a total yield which includes grades #1 to #4 for hand harvest, and grades #1 to oversize (OS) for machine harvest, (including nubs and crooks) in ton/acre, US \$/acre and a percent breakout by graded size. Please note that yields are for comparative purposes only. Small plots yields may not accurately reflect commercial yields.

*Parthenocarpic Hand Harvest (multi-pick):* Speed, Amarak, Liszt and Lennon were the highest yielding varieties with approximately US \$14,600, \$13,900 and \$13,800 (Liszt, Lennon) and 23, 24, and 26 (Liszt, Lennon), respectively. Most varieties were in the US \$12,000 to \$11,000 and 23 tons per acre range (Table 1).

*Conventional Machine Harvest:* Chaperon and Expedition were the highest yielding varieties with approximately yield of US \$2,700 and \$2,400 and 12.5 and 10.9 tons/acre, respectively. Most varieties were in the US \$2,300 to \$1,800 and 10 to 11 tons per acre range (Table 2).

*Parthenocarpic Machine Harvest:* Henley, Springsteen and V 5025 were the highest yielding varieties with approximately US \$6,000, \$5,700 and \$5,000 per acre and 24, 20, and 18 tons/acre, respectively. Most varieties were in the US \$4,000 to \$3,000 per acre range (Table 3).

**Table 1:** Yield of cucumbers harvested from the parthenocarpic hand harvest (multi-pick) variety trial, Simcoe, ON, 2023.

Variety	Source	Total Yield		Fruit/ Plant	Percent Breakout							
		1-4, NC			by weight							
		T/ac	\$/ac		N/C	1AB	2A	2B	3A	3B	4	O/S
Speed	Nunhems	23.1 a	14,555 a	40	4	39	34	16	6	2	0	0
Amarok	Bejo	23.9 a	13,879 a	33	3	31	35	19	7	4	1	0
Liszt	Rijk Zwaan	25.9 a	13,814 a	33	2	25	33	25	11	4	1	0
Lennon	Rijk Zwaan	25.6 a	13,803 a	44	4	27	30	25	10	2	1	0
Aristan	Bejo	19.9 a	12,778 a	33	3	40	33	18	4	2	0	0
Merengue	Seminis	23.5 a	12,478 a	32	6	26	32	24	8	4	0	0
Rubinstein	Rijk Zwaan	22.7 a	12,435 a	29	7	29	33	21	7	3	0	0
Absolut	Bejo	23.1 a	11,906 a	27	5	24	31	26	9	4	1	0
Puccini	Rijk Zwaan	19.8 a	11,178 a	35	5	31	31	23	7	3	1	1
Abbey	Bejo	18.8 a	9,484 a	39	6	23	32	22	10	5	1	0
Soil Type	: Very fine sandy loam		Fertility	: 100 lbs/ac of N								
Soil pH; % OM	: 7.2; 1.5			: 70 lbs/ac of P								
Planting Date	: May 31			: 100 lbs/ac of K								
Row Spacing	: 5ft.		Herbicides	: Command 0.4 L/acre PRE								
Plant Spacing	: 6"		Harvest Dates	: July 17 - August 18 (10 total)								

Means followed by same letter do not significantly differ (P=.05, Tukey's HSD)

\* Yields are for comparative purposes only. Small plot yields may not accurately reflect commercial yields.

**Table 2:** Yield of cucumbers harvested from the conventional machine harvest (simulated once-over harvest) variety trial, Simcoe, ON, 2023.

Variety	Source	Total Yield 1-OS, NC		Fruit/ Plant	Percent Breakout by weight							
		T/ac	\$/ac		N/C	1A	2A	2B	3A	3B	4	O/S
Chaperon	Seminis	12.5 a	2,664 a	2.1	5	2	2	14	28	27	2	19
Expedition	Seminis	10.9 a	2,443 a	1.9	4	3	6	18	20	30	7	12
Stronghold	Seminis	9.3 a	2,333 a	1.9	4	4	5	23	29	24	10	0
Gatehouse	Seminis	10.8 a	2,043 a	1.8	4	1	6	15	16	24	6	28
Journey	Seminis	11.8 a	1,941 a	1.9	4	3	4	8	21	19	11	31
Peacemaker	Seminis	9.7 a	1,858 a	1.6	3	1	3	17	15	24	18	18
Vlaspik	Seminis	8.0 a	1,470 a	1.6	3	5	3	9	18	29	16	18

  

Soil Type	: Fine sandy loam	Fertility	: 100 lbs/ac of N
Soil pH; % OM	: 6.3; 1.1		: 70 lbs/ac of P
Planting Date	: June 27		: 100 lbs/ac of K
Row Spacing	: 30"	Herbicides	: Command 0.4 L/acre PRE
Plant Spacing	: 4"	Harvest Date	: August 10 (44 DTH)

Means followed by same letter do not significantly differ (P=.05, Tukey's HSD)

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**Table 3:** Yield of cucumbers harvested from the parthenocarpic machine harvest (simulated once-over harvest) variety trial, Simcoe, ON, 2023.

Variety	Source	Total Yield		Fruit/ Plant	Days to Harvest	Percent Breakout								
		1-OS, NC T/ac	\$/ac			by weight								
						N/C	1A	B	2A	2B	3A	3B	4	O/S
Henley	Rijk Zwaan	24.0 a	5,995 a	5.2	48	3	1	3	6	28	48	7	4	
Springsteen	Rijk Zwaan	20.1 ab	5,700 a	5.1	50	1	1	6	13	38	40	1	0	
V 5025	Nunhems	18.0 bc	4,988 ab	5.4	48	1	1	4	16	46	27	4	0	
Lennon	Rijk Zwaan	16.5 bc	4,237 bc	3.6	48	1	1	3	7	23	54	9	2	
Liszt	Rijk Zwaan	13.5 cd	3,203 cd	3.3	48	0	0	3	12	21	44	9	11	
Bowie	Rijk Zwaan	10.6 d	3,051 cd	4.3	50	2	4	14	39	29	12	0	0	
Gershwin	Rijk Zwaan	10.3 d	2,897 d	5.0	50	4	2	13	38	30	10	3	0	
Soil Type	: Fine sandy loam	Fertility	: 100 lbs/ac of N											
Soil pH; % OM	: 6.9; 1.7		: 70 lbs/ac of P											
Planting Date	: June 13		: 100 lbs/ac of K											
Row Spacing	: 30"	Herbicides	: Command 0.4 L/acre PRE											
Plant Spacing	: 8"	Harvest Dates	: Jul 31 (48 DTH), Aug 2 (50 DTH)											

Means followed by same letter do not significantly differ (P=.05, Tukey's HSD)

\* Yields are for comparative purposes only. Small plot yields may not accurately reflect commercial yields.