

RESEARCH REPORT 2024

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 2024: (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 29 using a standard cone seeder mounted on a John Deere planter. The plot size of the trials was 1.5 m (5 ft.) x 5 m (16.4 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 8 harvests from July 15 to August 13.

Machine Harvest Trials

The conventional and parthenocarpic machine harvest trials both included 7 and 8 commercial varieties, respectively, for evaluation. Trials were seeded on June 26 and June 13 for the conventional and parth machine harvest trials, respectively, using a standard cone seeder. The plot size for these trials was 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 12 (47 DTH). For the parth machine trial, the harvest days were July 30 (47 DTH), July 31 (48 DTH) and August 2 (50 DTH).

For all trials, the crop was grown according to accepted commercial practices used in Ontario. Data was taken on fruit length to diameter ratios (LD) on a weekly basis for hand harvest and once for machine harvest. Yields were measured at harvest as fruit weights (ton/acre), graded out by size and dollar value per acre. 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 1. LD, fresh internal, bitterness and brine data are 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): Abago, Speed, Springsteen and Lennon were the highest yielding varieties with approximately US \$15,800, \$15,600, \$15,100 and \$14,300 per acre and 35.6, 30.5, 31.5 and 32.0 tons per acre, respectively. Most varieties were in the US \$13,000 to \$11,000 and 27-24 t/acre range (Table 1).

Conventional Machine Harvest: Chaperon and Akropolis were the highest yielding varieties with approximately yield of US \$2,400 and \$2,200 per acre and 12.7 and 10.2 tons/acre, respectively (Table 2).

Parthenocarpic Machine Harvest: Springsteen, NUN 5062 and NUN 5063 were the highest yielding varieties with approximately US \$8,600, \$5,700 and \$5,000 per acre and 32.2, 21.8 and 21.1 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, 2024.

Variety	Source	Total Yield		Fruit/ Plant	Percent Breakout							
		1-4, NC t/ac	\$/ac		by weight							
					N/C	1AB	2A	2B	3A	3B	4	O/S
Abago	Bejo	35.6 a	15,823 a	32	6	18	20	27	18	9	1	0
Speed	Nunhems	30.5 a	15,621 a	34	6	26	21	28	15	2	0	1
Springsteen	Rijk Zwaan	31.5 a	15,132 a	31	14	25	22	21	12	5	2	0
Lennon	Rijk Zwaan	32.0 a	14,301 a	31	8	19	20	25	21	7	1	0
Absolut	Bejo	26.5 a	12,850 a	28	9	23	27	18	14	9	0	1
Artistan	Bejo	24.0 a	12,398 a	26	8	27	23	21	14	4	2	1
Merengue	Seminis	26.2 a	12,285 a	27	11	23	21	20	16	7	2	1
Amarok	Bejo	23.8 a	11,949 a	26	6	25	22	23	18	5	1	1
Liszt	Rijk Zwaan	26.4 a	11,715 a	31	4	16	21	29	18	8	1	2
Gerswhin	Rijk Zwaan	27.0 a	11,042 a	28	16	17	17	22	18	7	1	2
Soil Type	: Very fine sandy loam	Fertility	: 100 lbs/ac of N									
Soil pH; % OM	: 7.0; 1.5		: 70 lbs/ac of P									
Planting Date	: May 29		: 100 lbs/ac of K									
Row Spacing	: 5'	Herbicides	: Command 0.4 L/acre PRE									
Plant Spacing	: 6"	Harvest Dates	: July 15 - August 13 (8 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, 2024.

Variety	Source	Total Yield		Fruit/ Plant	Percent Breakout							
		1-OS, NC			by weight							
		t/ac	\$/ac		N/C	1AB	2A	2B	3A	3B	4	O/S
Chaperon	Seminis	12.7 a	2,377 a	1.9	5	3	5	11	20	27	17	12
Akropolis	Bejo	10.2 a	2,209 a	2.2	4	5	14	19	18	24	7	10
Stronghold	Seminis	11.5 a	2,082 a	2.0	4	3	8	19	9	25	6	25
Journey	Seminis	10.0 a	1,893 a	2.1	9	7	11	18	10	25	11	9
Vlaspik	Seminis	10.4 a	1,828 a	2.2	7	7	15	19	11	14	6	21
Expedition	Seminis	10.3 a	1,814 a	1.7	7	5	8	13	13	25	12	16
Peacemaker	Seminis	7.8 a	1,455 a	1.8	7	2	5	6	27	25	14	13
Soil Type	: Fine sandy loam	Fertility	: 100 lbs/ac of N									
Soil pH; % OM	: 6.7; 1.5		: 70 lbs/ac of P									
Planting Date	: June 26		: 100 lbs/ac of K									
Row Spacing	: 30"	Herbicides	: Command 0.4 L/acre PRE									
Plant Spacing	: 4"	Harvest Date	: August 12 (47 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, 2024.

Variety	Source	Total Yield		Fruit/ Plant	Days to Harvest	Percent Breakout							
		1-OS, NC				by weight							
		t/ac	\$/ac			N/C	1AB	2A	2B	3A	3B	4	O/S
Springsteen	Rijk Zwaan	32.2 a	8,584 a	8	50	3	0	0	6	65	24	1	0
NUN 5062	Nunhems	21.8 b	5,653 b	6	50	4	0	1	6	49	37	1	2
NUN 5063	Nunhems	21.1 b	5,076 bc	4	50	5	0	1	3	26	56	4	4
NUN 5050	Nunhems	17.6 bc	4,309 bcd	5	48	6	1	1	7	42	37	2	3
Lennon	Rijk Zwaan	16.1 bc	3,979 bcd	4	48	4	1	3	8	41	37	3	4
Henley	Rijk Zwaan	16.0 bc	3,964 bcd	5	47	3	1	3	15	31	39	5	4
Bowie	Rijk Zwaan	13.4 c	3,444 cd	5	50	8	0	5	17	36	32	1	0
Gershwin	Rijk Zwaan	11.7 c	2,859 d	4	50	10	1	7	22	31	25	4	0
Soil Type	: Very fine sandy loam		Fertility	: 100 lbs/ac of N									
Soil pH; % OM	: 6.9; 1.6			: 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	: July 30 (47 DTH), July 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.