

Michigan State University 2015 Seedless Pickling Cucumber Variety Trial

Ben Phillips, Michigan State University Extension
One Tuscola St., Saginaw, MI 48607
Office: 989.758.2502 Email: phill406@msu.edu

A pickling cucumber variety trial was planted at LaRaCha Farms (43.408290, -83.717725, Reese, Michigan). Nunhem's and Rijk Zwaan seed companies generously donated publicly available parthenocarpic (seedless) cucumber seeds to the trial.

On June 24, 2015 the 12 cultivars were randomized, and planted side-by-side in a single 450-foot pass perpendicular to tile lines through a 12-row wing section of a 36-row John Deere DB-60 planter. The planter was set up for 20-inch between row spacing and 10-inch in-row spacing. There were three different types of seed coats, yet all varieties passed through the planter without issue. The plot was planted at the corner of the headland planting 60 feet into the field. Three 150-foot subplots were paced out on the day of planting. The soil type was a Tappan-Poseyville complex typical of the pickling cucumber-growing region of Michigan's Saginaw Valley.

Curbit (2pt/a), and 48 lb of N from urea was applied to the disced field approximately two weeks before planting. An additional 12 lb of N was injected 2 x 2 at planting in a liquid starter fertilizer blend.

The cucumbers were cultivated on July 28, before tip-over. The cultivator pass partially covered RZ13 seedlings across all plots, and resulted in a 5% stand loss. But, harvests were taken where the most uniform stand occurred. Protective sprays occurred on July 18 (Previcur Flex + Bravo), July 27 (Ranman + Bravo), August 4 (Previcur Flex + Bravo), and August 11 (Ranman + Bravo). The tank mixes featured rates of Bravo at 24 oz/a, Ranman at 2.7 oz/a, and Previcur Flex at 19.2 oz/a.

Cultivars RZ02, NQ5543, and V5016 were harvested on August 11 (day 49), and the remaining varieties were harvested on August 15 (day 53). Harvest transects were 20-foot long sections of rows that were measured inside each of the three 150-foot subplots on August 10. Transects were determined by scouting each subplot for the most uniform stand across all varieties.

Each transect was destructively harvested by hand, and all cucumbers greater than 1 inch in diameter were placed into a labeled container. Each container was then sent through a sorter to separate cucumber size classes: 4s (> 2"), 3Bs (1.75 - 2"), 3As (1.5 - 1.75"), 2Bs (1.25 - 1.5"), 2As (1.0625 - 1.25"), and 1s (0.5 - 1.0625").

Harvest weights L:D ratios, and cull tallies of each size class were measured within each transect and subplot. Fruit per plant, and total bushel/acre yield calculations included culls. L:D ratios were measured from ten cucumbers per size class. If there were fewer than ten cucumbers in a size class, then they were all measured. Hollow centers were measured on 3Bs, and 3As by cutting cucumbers transversally in three places; stem end, center, and flower end. Gross revenue estimates were calculated with pricing information from Hartung Brothers Inc. (\$409.06/ton of 2A,Bs, \$273.46/ton of 3A,Bs, and \$22.60/ton of 4s).

Unreplicated assessments of pre- and post-brine qualities were performed. Pre-brine assessments were conducted on a subset of five random pickles in the 2- or 3-size class from each cultivar on the same day as each respective harvest. Skin toughness was determined by slicing a sliver of skin <5 mm in thickness and chewing it. Seed cavity firmness was determined by making a transverse cut through the middle of the cucumber, and pressing thumbs into the center of each half. Two evaluators measured skin toughness using a 1-9 scale (1=rubberiest, 9=crispest), and cavity firmness using a 1-9 scale (1=softest, 9=firmer).

Approximately ten pounds of 2- and 3-size cucumbers from each cultivar were placed in labeled onion bags and fermented at Custom Foods Incorporated (634 Kendrick St., Saginaw, MI 48602). Each cultivar was placed in a different fermentation tank and they were removed for cutting, packaging, and brine flavoring on October 21. A post-brine survey will be conducted at the Great Lakes EXPO.

Results

In the 3A size class, RZ07 (277 bu/ac) yielded more than RZ13 (66.3 bu/ac), Puccini (74.02 bu/ac), Bowie (103.53 bu/ac), RZ15 (84.46 bu/ac), Gershwin (90.82 bu/ac), and Bernstein (43.14 bu/ac) (Figure 1 and Table 1).

In total yield, RZ07 (738.79 bu/ac) yielded more than RZ15 (358 bu/a), Gershwin (261 bu/ac), and Bernstein (146 bu/ac) cultivars, and was the highest yielding variety. Bernstein was the lowest yielding variety, and was characterized by two long sideshoots per plant (up to 4 feet long) with blooms and small fruit along their lengths. It had the qualities of late-maturing multipick varieties.

By gross revenue, RZ07 was still the most productive variety (\$4757.85/ac) (Table 3), while NQ5543 (\$2755.84), and NQ5007 (\$2772.37) fell in the ranks behind Stravinsky (\$3386.55) and Bowie (\$2967.33), and RZ11 (\$3438.79) fell behind V5016 (\$3501.18).

Hollow center was more prevalent this year than last year, and culls were mostly attributed to hail damage (Table 2).

Special thanks to Caitlin Burkman, Paul Horny, Dennis Fleishman, George Pape, Chris Dyk, and the Bauer family, and to Phil Hedden, Don Percy, and Taylor Morrison from Hausbeck Pickle Company.

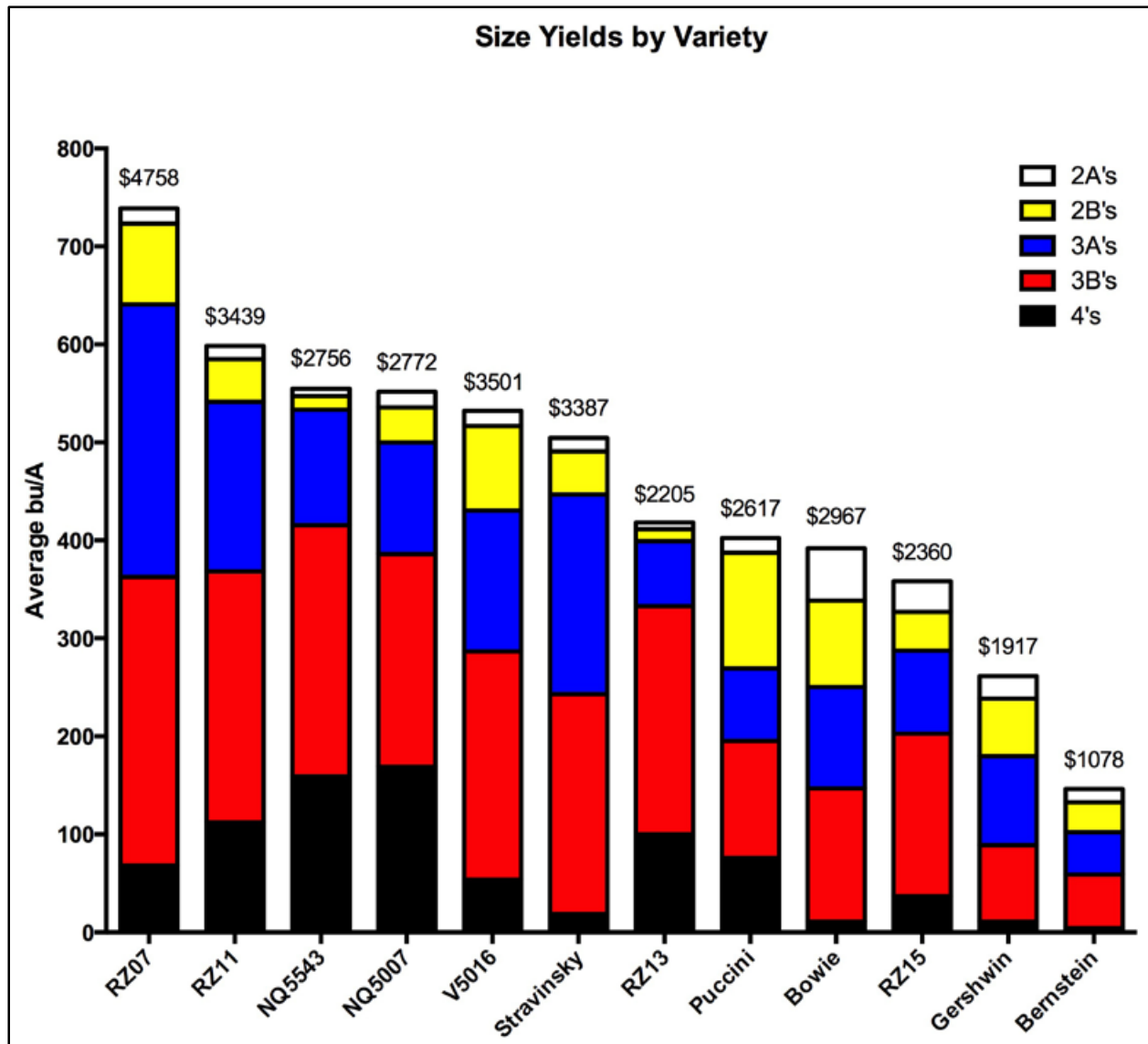


Figure 1. Performance in bushels/a (Bu/A) of twelve sprayed cucumber cultivars planted at LaRaCha Farms, Reese, Michigan, and the proportion of sizes 2A, 2B, 3A, 3B, and 4. Dollars per acre listed above each bar was summed from the dollar value of each size class at Hartung Brothers Inc. (\$409.06/ton of 2A,Bs, \$273.46/ton of 3A,Bs, and \$22.60/ton of 4s). The trial was planted at 20 inches between rows, and 7 inches in-row. Protective sprays occurred on July 18 (Previcur Flex + Bravo), July 27 (Ranman + Bravo), August 4 (Previcur Flex + Bravo), and August 11 (Ranman + Bravo). The tank mixes featured rates of Bravo at 24 oz/a, Ranman at 2.7 oz/a, and Previcur Flex at 19.2 oz/a. Cultivars RZ02, NQ5543, and V5016 were harvested on August 11 (day 49), and the remaining varieties were harvested on August 15 (day 53).

Table 1. Performance in bushels/a (Bu/A) of twelve sprayed cucumber cultivars planted at the LaRaCha Farms, Reese, Michigan, and the proportion of sizes 2A, 2B, 3A, 3B, and 4. The trial was planted at 20 inches between rows, and 10 inches in-row. Protective sprays occurred on July 18 (Previcur Flex + Bravo), July 27 (Ranman + Bravo), August 4 (Previcur Flex + Bravo), and August 11 (Ranman + Bravo). The tank mixes featured rates of Bravo at 24 oz/a, Ranman at 2.7 oz/a, and Previcur Flex at 19.2 oz/a. Cultivars RZ02, NQ5543, and V5016 were harvested on August 11 (day 49), and the remaining varieties were harvested on August 15 (day 53).

Variety	Co. ¹	Type ²	Fruit/ Plant ₃	Plants/A	Bushels/Acre ³						Proportions of Yield				
					Total	4	3B	3A	2B	2A	4	3B	3A	2B	2A
RZ07	RZ	Amer	3.29	31,468.53	738.79	68.11	294.70	277.90	82.64	15.44	0.09	0.40	0.38	0.11	0.02
RZ11	RZ	Euro	2.87	29,720.28	598.48	112.16	256.10	173.01	43.59	13.62	0.19	0.43	0.29	0.07	0.02
NQ5543	NU	Amer	2.21	30,594.41	554.89	158.93	256.56	117.61	14.08	7.72	0.29	0.46	0.21	0.03	0.01
NQ5007	NU	Amer	2.01	34,090.91	551.71	168.92	217.05	113.97	35.87	15.89	0.31	0.39	0.21	0.07	0.03
V5016	NU	Amer	2.73	30,594.41	532.19	53.58	232.94	143.94	86.28	15.44	0.10	0.44	0.27	0.16	0.03
Stravinsky	RZ	Amer	2.86	26,660.84	504.49	18.62	224.32	203.88	44.05	13.62	0.04	0.44	0.40	0.09	0.03
RZ13	RZ	Amer	2.65	20,979.02	418.21	99.90	232.94	66.30	12.26	6.81	0.24	0.56	0.16	0.03	0.02
Puccini	RZ	Amer	1.95	28,846.15	402.32	75.83	119.42	74.02	118.06	14.98	0.19	0.30	0.18	0.29	0.04
Bowie	RZ	Amer	2.75	26,660.84	391.87	10.90	135.77	103.53	88.09	53.58	0.03	0.35	0.26	0.22	0.14
RZ15	RZ	Amer	1.87	29,283.22	358.27	36.78	166.19	84.46	39.51	31.33	0.10	0.46	0.24	0.11	0.09
Gershwin	RZ	Amer	1.61	27,972.03	261.55	10.90	78.10	90.82	58.58	23.16	0.04	0.30	0.35	0.22	0.09
Bernstein	RZ	Amer	0.81	32,779.72	146.21	4.09	54.94	43.14	30.42	13.62	0.03	0.38	0.30	0.21	0.09

¹Seed companies: NU = Nunhems, RZ = Rijk Zwan.

²Type of fruit skin: American (Amer), or European (Euro).

³Fruit/plant and total bushels/acre includes culls, but excludes 1s.

Table 2. Pre-brine qualities, cull percentages of sizes 2A, 2B, 3A, and 3B, and hollow center percentages of 3As and 3Bs from twelve sprayed cucumber cultivars planted at LaRaCha Farms, Reese, Michigan. The trial was planted at 20 inches between rows, and 10 inches in-row. (Protective sprays occurred on July 18 (Previcur Flex + Bravo), July 27 (Ranman + Bravo), August 4 (Previcur Flex + Bravo), and August 11 (Ranman + Bravo). The tank mixes featured rates of Bravo at 24 oz/a, Ranman at 2.7 oz/a, and Previcur Flex at 19.2 oz/a. Cultivars RZ02, NQ5543, and V5016 were harvested on August 11 (day 49), and the remaining varieties were harvested on August 15 (day 53).

Variety	Co. ¹	Type ²	Pre-Brine Quality		Cull%					Hollow Center%	
			Seed Cavity Firmness ³	Skin Toughness ⁴	3B	3A	2B	2A	Total	3B	3A
NQ5007	NU	Amer	3.2	2.6	22.93	20.03	35.60	26.19	17.68	0.00	0.00
NQ5543	NU	Amer	1.8	6	24.04	24.75	4.76	58.33	18.77	2.15	3.03
V5016	NU	Amer	1.6	5.2	27.38	15.94	14.89	8.33	15.66	11.19	6.67
Puccini	RZ	Amer	2.2	8	32.01	23.47	38.10	16.67	16.43	0.00	0.00
Stravinsky	RZ	Amer	3.2	7	26.94	29.84	38.96	4.76	20.85	7.68	8.67
Gershwin	RZ	Amer	4.6	5.8	6.67	19.44	31.98	17.17	16.05	0.00	8.33
Bernstein	RZ	Amer	4.8	5.6	16.67	0.00	38.89	5.56	11.30	0.00	0.00
Bowie	RZ	Amer	4	6.6	25.56	18.59	10.69	15.70	16.08	11.90	6.25
RZ07	RZ	Amer	1	7.4	20.35	13.62	34.13	0.00	14.05	7.43	5.98
RZ11	RZ	Euro	1.8	3.4	18.60	14.41	12.73	4.76	13.31	2.57	1.28
RZ13	RZ	Amer	2.6	4	28.04	24.24	30.00	0.00	21.31	3.14	0.00
RZ15	RZ	Amer	5.8	5.2	20.74	22.08	57.78	33.33	17.39	0.00	0.00

¹Seed companies: NU = Nunhems, RZ = Rijk Zwan.

²Type of fruit skin: American (Amer), or European (Euro).

³1-9 scale; 1=softest, 9=firmer. ⁴1-9 scale; 1=rubberiest, 9=crispest.

Table 3. Dollar per acre, and length and diameter (L:D) ratios from twelve sprayed cucumber cultivars planted at LaRaCha Farms, Reese, Michigan. The trial was planted at 20 inches between rows, and 10 inches in-row. Protective sprays occurred on July 18 (Previcur Flex + Bravo), July 27 (Ranman + Bravo), August 4 (Previcur Flex + Bravo), and August 11 (Ranman + Bravo). The tank mixes featured rates of Bravo at 24 oz/a, Ranman at 2.7 oz/a, and Previcur Flex at 19.2 oz/a. Cultivars RZ02, NQ5543, and V5016 were harvested on August 11 (day 49), and the remaining varieties were harvested on August 15 (day 53).

Variety	Co. ¹	Type ²	\$/Acre Revenue ³						L:D ratios			
			Total	4	3B	3A	2B	2A	3B	3A	2B	2A
RZ07	RZ	Amer	4,757.85	36.94	1,934.13	1,823.86	811.34	151.57	2.77	3.14	3.25	3.56
V5016	NU	Amer	3,501.18	29.06	1,528.82	944.71	847.01	151.57	2.99	3.06	3.20	2.22
RZ11	RZ	Euro	3,438.79	60.83	1,680.81	1,135.44	427.96	133.74	2.99	3.04	3.41	3.26
Stravinsky	RZ	Amer	3,386.55	10.10	1,472.20	1,338.09	432.42	133.74	2.76	2.94	2.47	2.24
Bowie	RZ	Amer	2,967.33	5.91	891.07	679.48	864.84	526.04	2.84	2.82	3.19	2.92
NQ5007	NU	Amer	2,772.37	91.62	1,424.52	748.02	352.18	156.03	3.03	3.27	3.41	3.78
NQ5543	NU	Amer	2,755.84	86.20	1,683.79	771.86	138.20	75.78	2.98	3.09	2.08	3.30
Puccini	RZ	Amer	2,616.86	41.13	783.78	485.77	1,159.06	147.11	2.69	2.74	2.51	3.29
RZ15	RZ	Amer	2,360.44	19.95	1,090.74	554.31	387.84	307.60	2.83	2.83	3.13	3.23
RZ13	RZ	Amer	2,205.35	54.18	1,528.82	435.10	120.36	66.87	2.66	2.38	2.71	3.09
Gershwin	RZ	Amer	1,916.96	5.91	512.59	596.03	575.07	227.35	2.86	3.00	3.16	2.84
Bernstein	RZ	Amer	1,078.35	2.22	360.60	283.12	298.68	133.74	2.77	2.93	3.14	2.21

¹Seed companies: NU = Nunhems, RZ = Rijk Zwan.

²Type of fruit skin: American (Amer), or European (Euro).

³Dollar/acre revenue values based on \$409.06/ton of 2A,Bs, \$273.46/ton of 3A,Bs, and \$22.60/ton of 4s (Hartung Brothers Inc.).