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2020 Seedless Pickling Cucumber Variety Trial

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A pickling cucumber variety trial was planted at the Saginaw Valley Research and Extension Center (43.399097, -83.694497, Frankenmuth, Michigan). Bejo (BJ), Nunhems (NU), and Rijk Zwaan (RZ) seed companies donated parthenocarpic (seedless) varieties for mechanical once-over harvest.

Materials and Methods

On 15 June 2020, 15 parthenocarpic pickling cucumber varieties were planted in a completely randomized block design with four replications. Seeds were pre-counted and distributed into four rows by a cone planter. Rows were 20 ft long, 20 inches on-center, with 10 inch in-row spacing targeting 30,000 seeds per acre. The soil type was a Tappan-Londo loam with a poor-moderate drainage class, typical of the pickling cucumber-growing region of Michigan's Saginaw Valley.

On 30 March 150 pounds 46-0-0 was preplant incorporated, resulting in ~70 lb N per acre. On 16 June, Curbit (ethalfluralin) and Command (clomazone) preemergent herbicide was applied at 2 pints per acre and 1 pint per acre, respectively. On 29 June, all plots were thinned to 29,000 plants per acre. On 15 July, Ranman (cyazofamid) and Bravo (chlorothalonil) were applied at 2.5 fl. oz. per acre and 1 pint per acre, respectively.

Four reps of all cultivars were harvested and measured between 26 July - 3 Aug (day 42-47). We harvested 29 plants from the middle two rows of the four-row plots when the fruits began reaching advanced sizes consistently across all replications. All fruit were removed from the plants and sent through a sorter that separated and weighed them by the following sizes: 2As (1 1/16" – 1 ¼"), 2Bs (1 ¼" – 1 ½"), 3As (1 ½" – 1 ¾"), 3Bs (1 ¾" - 2"), and 4s (> 2" in diameter). L:D ratios, hollow center and monkeyface percentages were measured from ten cucumbers per size class, subsampled from a combination of all replications of a variety. Hollow centers were counted if a hole larger than 1/16" could be seen in the center of the seed cavity. A monkeyface was counted if holes larger than 1/16" could be seen along the outside of the seed cavity. Fruit per plant, bushels per acre of each size class and combined total bushel per acre yield calculations do not include culls. With a 29,000 plant per acre population, we multiplied the measured yields from 29 plants by 1,000 to obtain a per-acre estimate.

Results and Discussion

The season was characterized by dry spells, but the plots received two well-timed rains in weeks 4 and 5. Heavy rains in the last week of the trial resulted in muddy harvest conditions (Table 3).

The top five varieties with the highest combined yields of 2B and 3A fruit were RZ06, RZ16, RZ22, V5025, and Aristan (Table 1). Of those, RZ16 and V 5025 had L:D ratios closest to the desired 3.0 in the 3A size class. The top five varieties with the highest combined yields of 3A and 3B were Aristan, RZ22, RZ06, RZ10, and RZ16. Of these, RZ16 had the L:D ratios closest to 3.0 in both size classes. Cull rates were between 0% and 20%. The five varieties with the

lowest cull percentages were RZ07, V5025, Amarok, RZ10, and RZ19. The five varieties with the highest cull percentages were Gershwin, RZ21, RZ04, RZ06, and Absolut.

Half of the Rijk Zwaan varieties (RZ07, RZ10, RZ17, RZ19, RZ22), and the two Nunhems varieties, were harvested by day 43. But the latest varieties – Aristan, Gershwin, and RZ21 – were harvested on day 47 (Table 2).

Table 1. Yield data of 15 seedless picking cucumber varieties at the Saginaw Valley Research and Extension Center in 2020. Values in bold indicate the variety performed statistically similar to the variety with the highest value for that column. Plant population was 29,000 plants per acre.

Company and Variety	Bushels Per Acre							Fruit per plant
	Total	4	3B	3A	2B	2A	Cull	
BJ Aristan	434.2	37.4	157.1	**140.9**	79.9	18.9	**22.1**	2.7
RZ 06	391.8	2.4	92.0	**163.1**	97.6	36.7	**33.9**	2.8
RZ 16	387.7	13.0	88.6	**147.1**	110.6	28.2	**25.3**	2.7
RZ 22	383.3	13.2	114.8	**141.9**	94.9	18.5	8.6	2.7
BJ Amarok	377.3	48.5	113.9	**103.4**	83.1	28.4	6.1	2.6
RZ 10	352.4	23.8	121.1	**114.7**	78.0	14.8	5.8	2.3
NU V5025	337.8	4.6	74.1	**133.7**	97.8	27.6	4.5	2.6
RZ 17	322.6	16.1	138.0	99.2	54.8	14.5	13.3	1.9
BJ Absolut	288.3	19.9	56.8	89.2	83.3	39.1	**22.2**	2.2
RZ 19	287.8	33.6	107.6	77.8	47.0	21.7	4.8	1.8
RZ 07	282.4	11.6	44.6	**113.2**	82.3	30.6	0.0	2.2
RZ 21	280.9	31.6	37.4	56.0	99.4	**56.4**	**48.0**	2.3
NU V5031	275.4	2.3	45.0	**104.1**	93.4	30.7	13.5	2.6
RZ Gershwin	258.2	20.4	40.2	69.7	82.5	**45.3**	**51.6**	2.0
RZ 04	234.8	21.8	42.7	48.8	70.7	**50.8**	**30.6**	1.8
MSerror	10601.3	460.2	3467.2	1841.5	779.5	126.6	104.5	0.4
Df	42	42	42	42	42	42	42	42
Mean	326.3	20.0	84.9	106.9	83.7	30.8	19.4	2.3
CV	31.6	107.1	69.3	40.2	33.4	36.5	52.8	26.0
t.value	2.018	2.018	2.018	2.018	2.018	2.018	2.018	2.018
LSD	NS	NS	NS	61.2	NS	16.1	14.6	NS
p-value	0.238	0.136	0.072	0.009	0.169	<0.001	<0.001	0.232

Table 2. Quality data of 15 seedless picking cucumber varieties planted at the Saginaw Valley Research and Extension Center in 2020. Values are averaged across four replicates. No statistics were performed on quality data. Plant population was 29,000 plants per acre.

Company and Variety	L:D Ratios		%Hollow	%Monkey face	%Cull	Days after planting
	3B	3A				
BJ Aristan	2.4	2.4	0.0	0.0	5.1	47
RZ 06	2.6	2.5	0.0	0.0	8.6	46
RZ 16	2.6	2.9	0.0	0.0	6.5	45
RZ 22	2.6	2.8	0.0	0.0	2.2	42
BJ Amarok	2.4	2.5	0.0	0.0	1.6	45
RZ 10	2.8	2.6	0.0	0.0	1.6	42
NU V5025	2.6	2.9	0.0	0.0	1.3	43
RZ 17	2.7	3.0	0.0	0.0	4.1	42
BJ Absolut	2.5	2.9	0.0	10.0	7.7	46
RZ 19	2.7	3.0	0.0	0.0	1.7	43
RZ 07	2.5	2.7	0.0	0.0	0.0	42
RZ 21	2.7	2.9	0.0	0.0	17.1	47
NU V5031	2.5	2.9	0.0	0.0	4.9	43
RZ Gershwin	3.0	2.9	0.0	0.0	20.0	47
RZ 04	2.5	2.7	0.0	0.0	13.0	46
Mean	2.6	2.8	0.0	0.7	6.4	44
StDev	0.2	0.2	0.0	2.6	6.0	2.0
CV	6.06	6.14	NA	387.3	94.7	4.6

Table 3. Weather data summarized by weeks between 15 June and 3 Aug at the Saginaw Valley Research and Extension Center in 2020. Temperatures were averaged by week, and precipitation is total number of inches received for that week.

Week	Max Air Temp (F)	Min Air Temp (F)	Max Soil Temp (F)	Min Soil Temp (F)	Precipitation (inches)
1	85.1	57.1	71.5	67.1	0.0
2	82.1	58.6	72.2	68.7	0.1
3	90.7	60.9	77.8	72.9	0.0
4	88.8	66.4	78.9	75.2	1.5
5	84.3	63.6	78.0	74.0	1.2
6	83.8	61.7	78.5	74.0	0.0
7	81.7	60.5	78.2	73.9	2.5
8	76.6	62.2	74.7	70.9	0.1
Mean	84.2	61.4	76.2	72.1	0.7
StDev	4.4	2.9	3.0	2.9	0.9
CV	5.2	4.7	3.9	4.0	143.3

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