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2018 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). Rijk Zwaan (RZ) and Bejo (BJ) seed companies donated parthenocarpic (seedless) cucumber seeds for the trial.

Materials and Methods

On 7 June 2018, 16 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 and hoed to a final population of 26,136 plants per acre. The soil type was a Tappan-Londo loam with a poor-moderate drainage class, typical of the pickling cucumber-growing region of the Saginaw Valley.

On 30 May 180 pounds 46-0-0 was preplant incorporated, resulting in ~80 lb N per acre. On 7 June, Curbit (ethafluralin) and Command (clomazone) preemergent herbicide was applied at 2 pints per acre and 1 pint per acre, respectively. On 3 July, the plots were thinned to one plant every 10 inches. The weather was hot and dry after planting, and no fungicides were required for downy mildew control.

Three reps of all cultivars were harvested and measured on 25 July (day 48). Twenty plants were taken from one of the middle rows in the 4-row plots. All fruit were removed from the plants and sent through a sorter: 4s (> 2" in diameter), 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 and L:D ratios of each size class were measured. L:D ratios were measured from ten cucumbers per size class. If there were fewer than ten cucumbers in a size class, they were all measured. If there were no cucumbers in a size class, the cell was marked "N/A". Fruit per plant, and total bushel per acre yield calculations do not include culls.

Results and Discussion

RZ10, Liszt, RZ6, RZ8, Amarok and Absolut had high yields (Table 1). Rubinstein, Liszt, RZ6, RZ11, Artist, Amarok, Aristan, and Absolut sized up faster in the heat and yielded more fruit in size class 4 at harvest. Cull rates from crooked or nubbed fruit were between 3.87% and 18.69%. RZ8, RZ7, Aristan, RZ10 and Rubenstein appear to be the best performing varieties in 2018, with the highest 3B and 3A yields after factoring in cull and hollow center percentages.

Subplot data measurements of certain size classes within varieties was missing for several entries. Therefore, data on L:D ratios and hollow centers was not analyzed, and only means and coefficient of variation are displayed (Table 2). Despite hot and dry conditions that favored malformations, Aristan, and RZ7 each had low percentages of hollow centers. This suggests an adaptability of those varieties to hot and dry growing conditions. The low percentage for Amour and Anson is mostly from 2B and 2A size classes and fewer reps.

The L:D ratios trended less than 3 for sizes 3B and 3A, but closer to 3 for sizes 2B and 2A (Table 2). This may have been an environmental effect reflecting the low moisture and heat conditions at the time that 3B and 3A fruit were developing.

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Due to high heat and little rain (Table 3), all varieties experienced three separate germination periods over the course of three weeks. By the second week, most of all plants had emerged, but plant sizes were inconsistent in all plots.

Table 1. Yield and quality data on 16 seedless pickling cucumber varieties planted at the Saginaw Valley Research and Extension Center in 2018. Values are averaged across three replicates. Values in **bold** indicate that the variety performed statistically similar to the variety with the highest value for that column, as determined through a Least Significant Difference test at $\alpha = 5\%$ and a two-tailed t-statistic ($_{30,0.05}$). NS indicates that there were no significant differences between varieties. Rows were 20 ft long, 20 inches on-center, with 10 inch in-row spacing targeting 30,000 seeds per acre and hoed to a final population of 26,136 plants per acre.

Variety	Bushels Per Acre						Fruit Per Plant	% Cull
	Total	4	3B	3A	2B	2A		
RZ10	477.90	115.26	277.44	59.22	18.68	7.29	2.62	12.51
Liszt	474.71	292.48	146.69	23.69	6.38	5.47	2.27	3.88
Absolut	391.34	156.72	179.50	33.26	20.50	1.37	2.02	6.85
RZ6	387.69	200.45	99.77	46.47	22.78	18.22	2.02	11.13
RZ8	367.19	21.87	220.50	92.03	20.50	12.30	2.00	15.01
Amarok	362.18	67.42	158.54	85.65	28.70	21.87	2.40	7.95
RZ7	349.88	67.88	113.89	102.05	48.75	17.31	2.23	17.96
Aristan	344.41	122.55	116.63	67.42	26.42	11.39	1.92	18.69
RZ11	340.77	148.97	123.92	36.90	19.59	11.39	1.82	14.29
Rubinstein	339.86	133.48	129.38	52.85	11.84	12.30	1.87	7.83
Bowie	301.68	16.40	147.24	101.14	26.88	10.02	1.85	10.86
Artist	293.84	139.41	63.32	23.23	42.82	25.06	1.80	9.33
Gershwin	280.09	86.56	98.31	69.70	21.87	3.64	1.52	9.68
RZ9	206.37	43.73	64.69	42.37	33.26	22.32	1.47	8.71
Amour	144.42	42.37	38.72	5.92	23.69	33.71	1.27	9.31
Ansor	111.16	9.57	16.40	56.95	10.02	18.22	0.58	13.09
Mean	323.34	104.07	124.68	56.18	23.92	14.49	1.85	11.07
CV	23.26	60.01	43.89	60.52	51.55	49.27	19.15	58.74
t-value	2.042	2.042	2.042	2.042	2.042	2.042	2.042	2.042
LSD	125.402	104.136	91.243	56.692	20.561	11.906	0.591	NS
p-value	<0.0001	0.000	0.000	0.036	0.020	0.000	<0.0001	0.366

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Table 2. Length and diameter ratios and hollow center data on 16 seedless pickling cucumber varieties planted at the Saginaw Valley Research and Extension Center in 2018. No statistical analyses were performed on these variables.

Variety	Company	L:D Ratios				% Hollow Centers
		3B	3A	2B	2A	
RZ10	RZ	2.39	2.50	3.07	3.05	44.55
Liszt	RZ	2.45	2.60	3.09	2.83	28.31
Absolut	BE	2.53	2.76	3.11	2.70	54.90
RZ6	RZ	2.44	2.79	2.98	2.56	31.97
RZ8	RZ	2.68	2.91	3.28	3.39	27.84
Amarok	BE	2.32	2.49	2.46	2.89	51.84
RZ7	RZ	2.64	2.78	3.00	3.10	1.04
Aristan	BE	2.50	2.67	2.88	3.03	1.33
RZ11	RZ	2.56	2.63	3.05	3.09	19.57
Rubinstein	RZ	2.53	2.88	2.90	3.16	18.97
Bowie	RZ	2.59	2.67	2.94	3.35	90.28
Artist	BE	2.50	2.69	2.99	2.95	14.14
Gershwin	RZ	2.55	2.68	2.89	3.40	58.56
RZ9	RZ	2.44	2.68	2.75	3.10	10.63
Amour	BE	2.50	3.05	2.96	2.15	3.67
Ansor	BE	2.75	2.70	3.05	3.21	0.00
Mean	-	2.51	2.72	2.96	3.00	28.60
CV	-	4.24	7.05	9.28	17.01	93.64

Table 3. Averaged weekly weather data from the trial period (7 June – 25 July) taken from the Michigan Agricultural Weather Network station on site at the Saginaw Valley Research and Extension Center. Temperature is reported in Fahrenheit and precipitation is reported in inches. Air temperature was measured 5 ft off of the ground, and soil temperature was measured 2 inches below the soil surface.

Week	Max Air Temp	Min Air Temp	Max Soil Temp	Min Soil Temp	Precipitation
1	79.05	55.14	64.95	63.95	0.06
2	83.52	59.37	67.77	66.75	0.10
3	77.09	54.99	68.14	67.09	0.26
4	91.00	68.89	74.37	72.99	0.00
5	83.26	54.69	75.69	74.30	0.00
6	84.91	61.54	76.41	75.09	0.30
7	78.14	63.47	75.24	74.20	0.27
Mean	82.33	59.64	71.74	70.57	0.22
CV	7.86	12.28	6.33	6.29	116.12