

University of Rhode Island

DigitalCommons@URI

University of Rhode Island Vegetable
Production Research Reports

College of the Environment and Life Sciences

2019

URI 2019 Carrot Variety Trials – Orange Main Season Carrots

Rebecca Brown

brownreb@uri.edu, brownreb@uri.edu

Follow this and additional works at: https://digitalcommons.uri.edu/riaes_bulletin

Recommended Citation

Brown, Rebecca, "URI 2019 Carrot Variety Trials – Orange Main Season Carrots" (2019). *University of Rhode Island Vegetable Production Research Reports*. Paper 32.

https://digitalcommons.uri.edu/riaes_bulletin/32https://digitalcommons.uri.edu/riaes_bulletin/32

This Article is brought to you for free and open access by the College of the Environment and Life Sciences at DigitalCommons@URI. It has been accepted for inclusion in University of Rhode Island Vegetable Production Research Reports by an authorized administrator of DigitalCommons@URI. For more information, please contact digitalcommons@etal.uri.edu.

URI 2019 Carrot Variety Trials – Orange Main Season Carrots



Dr. Rebecca Nelson Brown brownreb@uri.edu or 401-874-2755 for more information

Entries

The main season orange carrot trial included eleven varieties in 2019. Varieties are listed in table 1. All were Nantes market class and were either listed by the supplier as main season varieties or had more than 60 days to maturity and were not labelled as early varieties. ‘Romance’, ‘Bolero’ and ‘Baltimore’ were supplied as pelleted seed; all others were raw seed.

Entry	Source
Bengala	Osbourne Seeds
Jerada	Osbourne Seeds
Hilmar	Osbourne Seeds
Nectar	Johnny’s Selected Seeds
Romance	Johnny’s Selected Seeds
Bolero	Johnny’s Selected Seeds
Bergen	Seedway
Baltimore	Seedway
Naval	Seedway
Goldfinger	Harris Seeds
Nantindo	Harris Seeds

Table 1. Varieties and sources for main-season orange carrot trial.

irrigation was provided as needed. The herbicide provided only partial control of weeds, and weed pressure was considerable, with significant differences between blocks, despite repeated cultivation and hand weeding. Five weeks after seeding carrots were side-dressed with 12-0-12 to provide an additional 50 lbs N/acre. Damage from *Alternaria daucii* was rate on August 22nd; bolting, canopy height and shoulder protrusion were also measured at this time. The center 5 feet of each plot was harvested beginning on August 22nd, 90 days after planting.

After harvest carrots were graded into marketable and cull, with marketable carrots sub-divided into US #1 and US #2 grades based on length and straightness. Counts and weights were recorded for each category. Five carrots randomly selected from those meeting US #1 standards were used to measure root length and width and then juiced to

Trial Conditions

The 2019 carrot trial was seeded May 26 and 27 using a Jang J-1 push seeder set to 1 inch spacing within row. Each 10 foot long plot contained 3 rows spaced 12 inches apart; plots were on 5 foot centers. Trial design was a randomized complete block with three replications. Prior to seeding the field was amended with Nature’s Turf 8-1-9 organic fertilizer to provide 50 lbs N/acre and lime at 435 lbs per acre to ensure adequate calcium levels. Treflan herbicide was incorporated into the top 3 inches of soil for weed control. Overhead



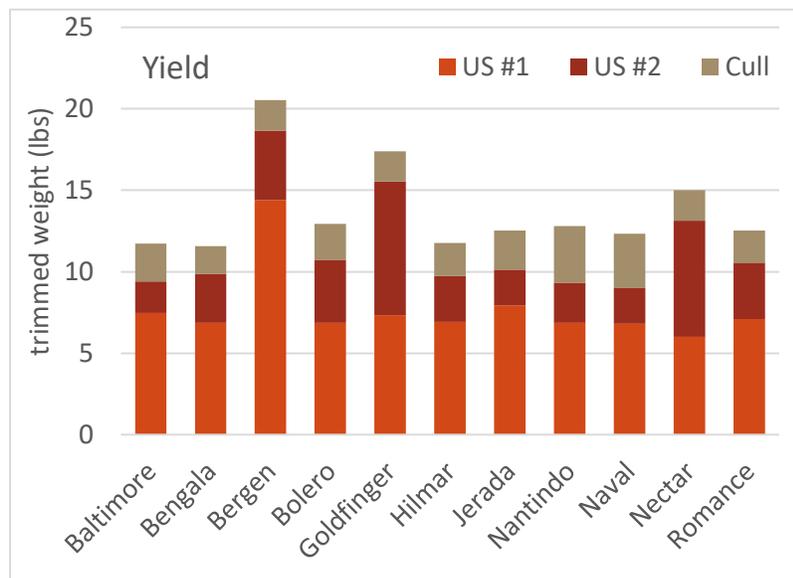
Main season carrot trial on July 19.

determine sugar content. Data were analyzed using mixed models ANOVA and post-hoc comparison of least squares means.

Results

Canopy Characteristics

Canopy height at maturity ranged from 52.7 cm for ‘Nantindo’ down to 35.2 cm for ‘Goldfinger’. Most entries were statistically similar with canopy heights of 40 to 46 cm (table 2). All canopies were large enough to provide good coverage and suppress weeds. Varieties did not differ significantly in response to *Alternaria daucii*. None were particularly susceptible to the disease and there was little damage except in plots exposed to high levels of inoculum. However, no varieties were truly resistant and all developed leafspot following extended cool, wet conditions. Crown height was at the soil surface for most entries, preventing problems with green shoulders (table 2). The exceptions were ‘Baltimore’ and ‘Romance’ which had average crown positions 1 to 2 cm above the surface. A few plants in one plot each of ‘Bolero’, ‘Nantindo’ and ‘Hilmar’ bolted. No bolting occurred in any of the other orange carrot varieties.



Carrot yields by grade. “US #1” carrots have minimum length of 5 inches, while “US #2” carrots are 3 to 5 inches in length. Culls were shorter than 3 inches, forked, seriously bent or twisted, or damaged.

There were no significant differences among the other entries. ‘Goldfinger’ and Nectar’ ranked second and third behind ‘Bergen’ in total yield, respectively, but both entries produced mostly roots which were less than 5 inches in length. ‘Nectar’ and ‘Goldfinger’ produced a significantly greater weight of US #2

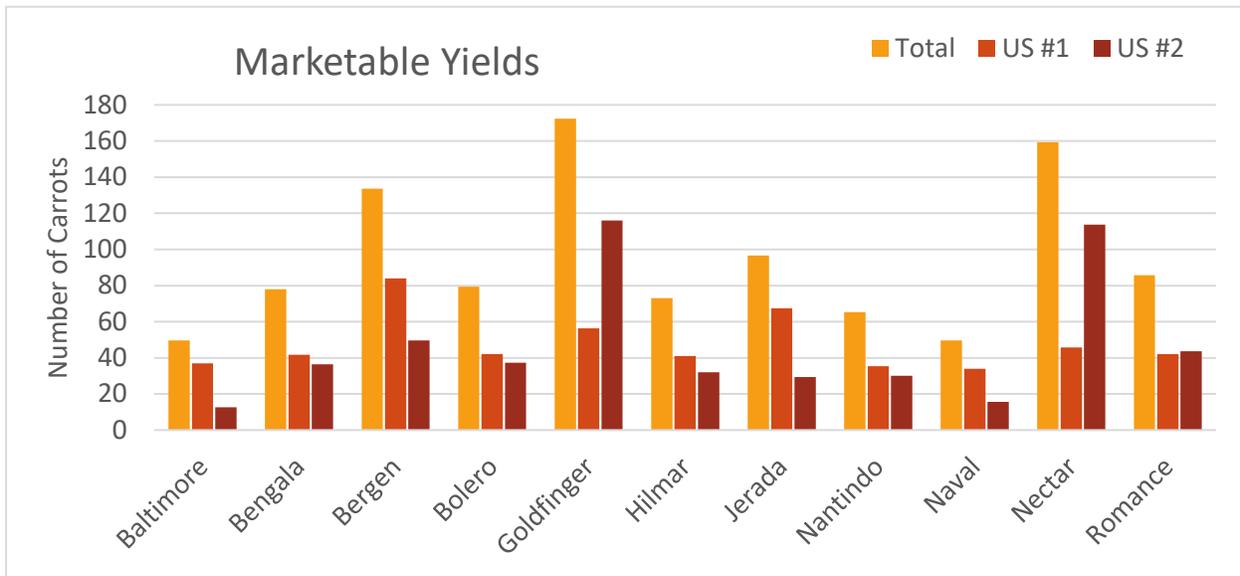
Entry	Canopy Height	Crown Height
Baltimore	44.7	2.3
Bengala	46.6	-0.2
Bergen	45.4	0.5
Bolero	44.3	0.3
Goldfinger	35.2	0.7
Hilmar	45.8	0.7
Jerada	41.2	-0.3
Nantindo	52.7	0.3
Naval	40.9	0.3
Nectar	40.2	0.0
Romance	40.3	1.3
LSD	8.0	1.2

Table 2. Canopy height and crown height relative to soil surface. Measurements are in centimeters. Values differing by the LSD value or more have a 95% chance of being meaningfully different.

Yields

‘Bergen’ produced the greatest total yields, averaging 20.5 lbs per harvested section. The harvested section was 15 ft² and contained 15 feet of row. ‘Goldfinger’ was statistically similar at 17.4 lbs. Most of the entries averaged 11.5 to 13 lbs. ‘Bergen’ also produced the greatest weight of roots meeting USDA grade standards for size and shape; at 14.4 lbs ‘Bergen’ produced twice as much as the average of the other 10 entries.

roots that any of the other entries. These two entries also had relatively short tops, so may be better suited to sale as bunching carrots. Entries did not differ significantly in the weight of culled roots. 'Bergen' yielded the most #1 roots per plot with an average of 84. 'Jerada' and 'Goldfinger' ranked second and third with averages of 67.3 and 56.3, respectively. 'Goldfinger' averaged 116 #2 roots per plot, closely followed by 'Nectar' at 113.7. Total number of marketable carrots per plot ranged from 172 for 'Goldfinger' to 50 for 'Naval'. 'Goldfinger', 'Nectar' and 'Bergen' were all statistically similar.



Carrot yields as number of total marketable, US#1 marketable and US #2 marketable roots per plot. Minimum significant difference values are 39 for total, 28 for US #1, and 46 for US #2.

Root Characteristics

US #1 roots ranged in length from 7.4 inches for 'Naval' to 5.5 inches for 'Goldfinger' with a significant difference of 0.9 inches (Table 3). Root diameter at the shoulders ranged from 1.4 inches for 'Nantindo' to 1.1 inches for 'Jerada' with a significant difference of 0.2 inches (Table 3). There were no significant differences in average root weight within grades, but entries differed significantly for the average marketable root weight pooled across grades. This difference reflects differences in the proportion of roots in each grade. 'Baltimore' had the heaviest roots at 3.2 ounces. 'Goldfinger' and 'Nectar' had the lightest roots, as would be expected given the relative abundance of US #2 roots in these entries. Root weight was highly variable, as reflected in the significant difference value of 1.0 ounces. 'Bengala' and 'Nectar' developed canker caused by *Alternaria daucii* infection of roots leading to increased culls and storage rot. Several entries with crowns at or above the soil surface developed green shoulders.

'Naval' had the sweetest roots at 9.7% on the Brix scale (Table 4). However, all entries except 'Baltimore', 'Hilmar', 'Jerada' and 'Nectar' were statistically similar. 'Goldfinger', 'Hilmar', 'Jerada' and 'Nectar' had the least variation in Brix across replications, suggesting that sugar levels in these entries are less sensitive to stress from weed competition.

Entry	US #1 Root Length (inches))	US #1 Root Width (inches)	Mkt Root Weight (oz)	Comments
Baltimore	6.4	1.3	3.2	Small crown with green ring at base
Bengala	6.6	1.3	2.0	Large lenticils; some Alternaria canker
Bergen	6.7	1.3	2.2	Large lenticils; no Alternaria canker
Bolero	6.6	1.3	2.2	Green ring at crown base
Goldfinger	5.5	1.1	1.4	Very small crowns
Hilmar	6.0	1.3	2.0	Green shoulders
Jerada	6.9	1.1	1.7	Small crowns
Nantindo	6.5	1.4	2.3	Purpling and browning of shoulders exposed to light
Naval	7.4	1.3	3.0	Green shoulders
Nectar	6.2	1.2	1.4	Some Alternaria canker
Romance	6.0	1.2	2.3	Very small crowns; green shoulders
LSD	0.9	0.2	1.0	

Table 3 Root characteristics for trial entries. Values within a column that differ by the LSD value or more are significantly different.

Entry	Brix Mean	Brix Variance	Flavor
Baltimore	8.0	0.64	Smooth and slightly sour
Bengala	9.5	0.17	Sweet and mellow
Bergen	9.3	0.25	Milky with nutty tones
Bolero	9.1	0.65	Bland and sweet
Goldfinger	8.9	0.01	Sweet and mellow
Hilmar	8.7	0.09	Milky sweet with bitter tones
Jerada	8.5	0.09	Very sweet and milky
Nantindo	9.1	0.65	Earthy and slightly sour
Naval	9.7	0.65	Earthy and slightly spicy
Nectar	8.5	0.09	Earthy
Romance	9.5	0.25	Sweet and nutty
LSD	1.0		

Table 4. Sugar content as percent brix and flavor notes for trial entries. Brix and flavor were determined using juice from 5 representative roots per plot. Entries with greater variance had more variation between replications. Carrots were stored for >6 weeks at 32°F prior to juicing.

Conclusions

'Bergen', 'Goldfinger' and 'Nectar' were the top yielding varieties. 'Bergen' would be the best choice for wholesale as topped carrots, while 'Goldfinger' would be an excellent option for bunching. 'Nectar' could be

sold either way, as tops were longer than 'Goldfinger' but roots were shorter than 'Bergen'. 'Nectar' also tended to be less sweet than the other two entries, and had more Alternaria canker on roots. All of the trial entries yielded marketable carrots and differences between entries tended to be subtle.

Acknowledgements

This trial was funded by the Rhode Island Agricultural Experiment Station and University of Rhode Island Cooperative Extension. Abby MacLeod, Emma Fernandez, Yaqoob Iqbal and Fari Gheshm assisted with field work.



Top-yielding carrot entries: 'Goldfinger' (left), 'Bergen' (center) and 'Naval' (right).