

## **2016 Early Spring LSU AgCenter Carrot Variety Trial**

### **Introduction:**

Carrots are an important part of the American diet. They are consumed fresh, steamed, baked, pickled and in a variety of dishes. The nutritional benefits of carrots are vast. Namely, carrots are high in vitamin A and dietary fiber. Carrots provide a number of important nutritional benefits such as lycopene, vitamin A and fiber. Depending on the color of the carrot, anthocyanins, carotenoids and other pigments act as antioxidants (Dias, 2014). Yellow carrots contain lutein, which may prevent macular degeneration (Dias 2012a and Dias 2012b).

Louisiana producers continuously strive to produce local, fresh and nutritious produce. In 2014, Louisiana vegetable producers grew 20 acres of carrots at a gross farm value of \$272,000 (LSU AgSummary, 2014). Carrots are planted in Louisiana in the fall and again in the early spring season. Carrots are directly sown on soil either broadcast in a bed or in double to quadruple drills on top of raised rows. There are three major classes of carrots:

- Emperor are long slender carrots with a pointed end
- Chantenay are short and wide carrots
- Nantes are long but have a blunt end

All of the listed carrot types and colors (white, yellow, orange, red and purple) can be grown in Louisiana. There are numerous varieties of carrots marketed to Commercial producers and home gardeners. Therefore, the LSU AgCenter in conjunction with three local farmers selected 14 varieties to see which carrots produced the top yielding and quality carrots.

### **Materials and Methods:**

The carrot variety trial was conducted in the early spring 2016 season. Fourteen carrot varieties were grown at three locations. Participating farms included Williams Farm in Batchelor, La (Commerce silty clay loam), The Northeast Research Station in St. Joseph, La (Commerce silt loam) and Covey Rise Farm in Husser, La (Toula silt loam). Carrots were directly sown in double drills on beds 48 inches wide. Individual carrot plots were 10 ft. long with 3 ft. of skip space between plots. Carrot seed was planted mid-January to early February and harvested in early May, between 95 and 108 days after sowing at each site. As carrots developed their first true leaf, they were hand thinned to one inch between plants. One square foot of carrots were harvested twice from each plot at each location. A 1ft by 1ft square was tossed randomly into each plot twice. Roots within the square were counted, weighed (pound) and measured for length (inch). Carrots were also graded. Carrots less than two inches in length, consisting of branched or twisted roots were termed unmarketable. All other carrots were termed marketable. Insect and disease pressure was not an issue in any of the three participating locations. Therefore, pesticides were not applied with the exception of pre-emergent herbicides in this study.

## Results and Discussion:

The three sites had different soil types. Williams Farm had the heaviest soil. Carrots in this soil branched slightly more than at the two other participating sites. Carrots at the Northeast Research station grew in the lightest sandiest soil and tended to be very slim and long. The Covey Rise carrots were more slender than the Williams Farm carrots but grew wider than those growing in the lightest soil.

- **‘Maverick’** was the top producing carrot in the trial in terms of number of roots produced per 100ft row (5,000 roots / 100ft row) and second in root length averaging 6.1 inches long. However, only 66% of ‘Maverick’ carrots harvested were marketable.
- **‘Yellowstone’** was second in total number of carrots produced per 100ft row (4,900 roots / 100ft row) and 4<sup>th</sup> in terms of total weight produced (370 lbs.). ‘Yellowstone’ carrots averaged 5.0 inches long. However, only 51% of ‘Yellowstone’ carrots were marketable.
- **‘Yellow Bunch’** carrots were third in total number of carrots produced (4,600 roots / 100 ft. row), second in total weight produced per 100 ft. row and 4<sup>th</sup> in average length. ‘Yellow Bunch’ had a whopping 89% marketable carrots harvested.
- **‘Yellow Sun’** carrots had brilliant color but were short and stubby; they were the only Chantenay type carrot grown in the trial. ‘Yellow sun’ carrots averaged 4 inches long with 4,200 produced on a 100ft row with 78% marketable harvest.
- **‘Apache’** also had 4,200 carrots/ 100ft row produced with an 80% marketable harvest. Approximately 330 lbs. of ‘Apache’ were produced on a 100ft row and they averaged 5.2 inches long.
- **‘Sugar Snax’** carrots were top in overall length averaging 6.4 inches. Approximately 3,800 roots were produced on a 100 ft. row weighing in at 360lbs. Eighty-eight percent of harvested carrots were marketable. ‘Sugar Snax’ was always long and thin even in the heaviest soil. We recommend ‘Sugar Snax’ as the top selected orange variety grown in this trial.
- **‘Kaleidoscope’** carrots were a mixed color seed packet containing the varieties ‘Atomic Red’, ‘Bambino’, ‘Cosmic Purple’, ‘Lunar White’ and ‘Solar Yellow’. Kaleidoscope was third in total weight with 390lbs of carrots produced/ 100ft row. The white carrots in this mix were always much longer and wider than the other colored carrots in this mix. The white carrot in Kaleidoscope may have contributed to the heavy weights achieved.
- **‘Purple sun’** carrots produced 3400 roots per 100ft row weighing a total of 260 pounds. The ‘Purple sun’ carrots averaged 5.0 inches in length and 77% were marketable.
- **‘Bolero’** produced 3300 carrots per 100ft row with a total weight of 370lbs same weight as ‘Yellowstone’ but nearly 1,000 less roots per 100ft row. ‘Bolero’ carrots averaged 4.9 inches in length and tended to be wide and short as compared to the other orange carrots at all three farms. Only 72% of ‘Bolero’ was marketable.
- **‘Danvers’** was the top producing carrot in terms of weight at 440lbs/ 100ft row but the carrots tended to be very wide and some roots were split. Producers who wish to grow this variety will be successful if they harvest much earlier than done so in this trial to avoid losing marketability because of tough fibrous roots.
- **‘Deep Purple’** was third in average length of roots but the longest producing carrot of all the purple carrots trialed averaging 5.9 inches in length. Eighty-three percent of ‘Deep

Purple' carrots were marketable making this the recommended purple carrot variety of the trial. The center portion of the root in 'Deep Purple' carrots is bright yellow.

- **'Purple Haze'** carrots were blotchy in appearance with their orange centers showing through the purple skin in all three locations. Eighty-five percent of 'Purple 68' carrots were marketable (third in marketability in this study) but overall produced very little roots.
- **'Purple 68'** carrots produced 2100 roots/ 100ft row with a total weight of 300lbs. These carrots had a nice appearance. They averaged 5.1 inches long and 85% of 'Purple 68' carrots were marketable.
- **'Nelson'** is a standard variety of orange carrots planted in Louisiana. They were very nice in appearance and uniform in shape. However, 'Nelson' produced the least number (1900 roots/ 100ft row) and lowest weight of carrots (220lbs) per 100 ft. row. Seventy-seven percent of 'Nelson' was marketable.

**Table 1. Carrots Grown in the 2016 LSU AgCenter Early Spring Carrot Variety Trial.**

Variety	Seed Source	Color	Total Number of Roots / 100ft Row	Total Weight (lbs.) / 100ft Row	Average Length	% Marketable
Maverick	Stokes Seed	Orange	5000	350	6.1	66
Yellowstone	High Mowing Seed	Yellow	4900	370	5.0	51
Yellow Bunch	Johnny's	Yellow	4600	430	5.6	89
Yellow Sun	Johnny's	Yellow	4200	350	4.0	78
Apache	Stokes Seed	Orange	4200	330	5.2	80
Sugar Snax	Johnny's	Orange	3800	360	6.4	88
Kaleidoscope	Burpee Seed	Mixed	3500	390	5.4	63
Purple Sun	Territorial Seed	Purple	3400	260	5.0	77
Bolero	Johnny's	Orange	3300	370	4.9	72
Danvers	Twilley Seed	Orange	3100	440	5.0	76
Deep Purple	Johnny's	Purple	3000	360	5.9	83
Purple Haze	Johnny's	Purple	2300	250	5.2	82
Purple 68	Johnny's	Purple	2100	300	5.1	85
Nelson	Johnny's	Orange	1900	220	5.3	77

Total number of roots/ 100 ft. row and total weight / 100 ft. row calculations are based on a farmer double drilling carrots on a 48-inch wide row continuously.

**Conclusions:**

The top producing carrot was selected for each color, orange, yellow and purple.

**‘Sugar Snax’** was the top performing orange carrot in the 2016 early spring carrot trial. Although ‘Sugar Snax’ produced less total carrots than both ‘Maverick’ and ‘Apache’, it produced slightly more marketable carrots than Maverick and slightly less (<20 carrots) than ‘Apache’ having an 88% marketable yield. Additionally, it averaged 6.4 inches in length, which was greater than ‘Maverick and ‘Apache’. ‘Sugar Snax’ also produced more total weight than both ‘Maverick and ‘Apache’ carrots.

**‘Yellow Bunch’** was the top performing yellow carrot in the 2016 early spring carrot trial. While ‘Yellow Bunch’ produced 300 less carrots per 100 ft. row as compared to ‘Yellowstone’ it produced 89% marketable yields making it have many more marketable number of roots and total marketable root weight. Additionally ‘Yellow Bunch’ roots were on average 0.6 inches longer than ‘Yellowstone’.

**‘Deep Purple’** was the top performing purple carrot in the 2016 early spring carrot trial. It produced slight fewer (<100) marketable roots as compared to ‘Purple Sun’ but averaged 100 more pounds produced per 100ft row. In addition, ‘Deep purple’ was on average almost a full inch (0.9 inches) longer than ‘Purple Sun’.

The 2016 early spring season was rather cool and dry, which is probably why we had to wait nearly 100days to harvest. Carrots in the fall can usually be harvested around the 70-day mark. The early spring season is a great time for both commercial producers and home gardeners to plant carrots, because of the minimal disease and insect pressure. As each season differs in environmental conditions, we will replicate this trial in the early 2017 spring season.

**Acknowledgments:**

This study was a team effort between local farmers, county agents, vegetable specialist and extension associate. Thank you to Mr. Lester Williams, Mr. and Mrs. Sandy Sharpe, Mr. Dennis Burns, Mrs. Kylie Miller, Mr. Bruce Garner, Mrs. Whitney Wallace and Mr. Bobby Williams for helping plant, maintain and harvest the data in this trial.

**Citations:**

Dias, J.S. (2012a) Major Classes of Phytonutriceuticals in Vegetables and Health Benefits: A Review. *Journal of Nutritional Therapeutics*, 1, 31-62.

Dias, J.S. (2012b) Nutritional Quality and Health Benefits of Vegetables: A Review. *Food and Nutrition Sciences*, 3, 1354-1374. <http://dx.doi.org/10.4236/fns.2012.310179>

Dias, J.S. 2014. Nutritional and Health Benefits of Carrots and Their Seed Extracts. *Food and Nutrition Sciences* 5: 2147-2156.

LSU AgCenter. 2014. LSU AgSummary 2014 State Totals.

<http://apps.lsuagcenter.com/agsummary/PowerUsers/2014statetotals.pdf> website last visited 7/16/2016. Page 35.