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Introduction

Cantaloupe continues to be one of the major vegetable crops produced in Kentucky. Production from 2007 to 2012 has been stable at more than 600 acres of production on a total of 550 farms (USDA, 2013). Christian, Casey, Lincoln, Hart, and Allen counties are the main production areas for Kentucky. Cantaloupe is the fifth largest vegetable crop produced in the state based on acreage and accounts for nearly 10% of the total vegetable acreage (USDA, 2013).

Farmers select varieties mostly based on market, yield, fruit quality, and disease resistance. Farmers primarily utilizing direct sales have greater flexibility in variety selection compared to those producing for wholesale markets. However, earliness is often another consideration as the market value is usually higher early in the production season. The objective of this experiment was to evaluate yield, fruit quality, and maturity for ten different cantaloupe varieties.

Materials and Methods

Seeding of ten cantaloupe varieties began on April 22 using 50-cell black seedling flats (Landmark Plastic, Akron, Ohio). A common peat-based substrate, Jiffy-Mix #17 (Jiffy Products of America, Lorain, Ohio), was the seedling media used.

Each of ten varieties was transplanted in the designated plots on May 20 at the Horticulture Research Facility into a Maury silt loam soil. Transplanting was done using a Rain-Flo waterwheel setter with 6 ft. between rows and 2.5 ft. in-row spacing. Plots were 50 ft. in length with twenty plants per plot.

A plasticulture production system was utilized using plastic-mulch-covered (4 ft. x 1 mil, Filmtech Plastics of the Sigma Plastics Group, Lyndhurst, New Jersey) raised beds with drip tape (12-inch emitter spacing, 30 gph/100 ft., Aqua Traxx, The Toro Company, Bloomington, Minnesota). Plastic and drip tape were installed using a Rain-Flo plastic layer/bed shaper.

Pre-plant fertilizer included 110 lbs. of urea (46-0-0) and 100 lbs. of muriate of potash (0-0-60) per acre. Weekly fertigation was planned, but due to the excessive rain fall, only five applications were made from June 3 to July 31. At each fertigation event, 9 lbs. of actual nitrogen/acre were applied using calcium nitrate, falling 25 lbs./acre short of the recommended rate of actual nitrogen for the season. Fertilization, diseases, and arthropod pests were managed using recommendations in University of Kentucky publication ID-36, *Vegetable Production Guide for Commercial Growers* (Bessin et al, 2014). The timing of preventative fungicide sprays was determined using MELCAST (Egel and Latin, 2012). Weekly scouting reports dictated insecticide applications through the production season.

Fruit were harvested three times per week beginning on July 16 and terminating August 5 for a total of nine harvests. Each fruit was weighed and three fruit from each variety and each replication were sampled for fruit quality including Brix, firmness, and other internal parameters. An analog penetrometer (FT, Wagner Instruments, Greenwich, Connecticut) was used for measuring fruit firmness. Soluble solids were measured using a refractometer (RF-12, Extech

Instruments, Nashua, New Hampshire). Yield data were analyzed by general linear model and means were separated by Fisher's least significant difference test using SAS statistical programs (SAS Institute, Cary, North Carolina).

Results and Discussion

Yields in 2015 were significantly reduced, ranging from 1,600 to 6,490 fruits per acre compared with 4,000 to 12,440 in 2014 (Table 1) (Saha and Hanks, 2014). Reduced yield was likely due to excessive rain in July, which promoted anthracnose, gummy stem blight diseases, and Fusarium crown rot. The average precipitation for July in Fayette County is 4.65 inches, while in 2015 9.66 inches fell (Weather Underground, 2015). In addition to promoting disease development, the rainy weather often prevented timely fungicide applications, and as the ground was saturated, it was impractical to fertigate, leading to a deficit of 25 lbs. of nitrogen/acre, compared to recommendations.

Average individual fruit weights ranged from 3.2 to 7.1 lbs. (Table 1). Nun26367MEM, Maxi East, and Samoa all had greater average fruit weights compared to the other varieties including the industry standards Aphrodite and Athena (Table 1). Other varieties that were comparable to Athena and Aphrodite for average fruit weight were Sweet East, Orange Sherbet, and Durawest (Table 1).

Athena, Wrangler, and Fantasista all had greater total fruit number per plot as compared to the other seven varieties evaluated (Table 1). Athena had the greatest yield by weight as compared to all other varieties with the exception of Aphrodite (Table 1). Other varieties that were comparable to Aphrodite were Fantasista, Sweet East, Nun26367MEM, and Wrangler.

Maxi East had the highest numerical soluble solids (12.4 Brix) as compared to all other varieties (Table 2). It had statistically greater soluble solids, however, compared to only four of the nine other varieties evaluated. Excessive July rains likely reduced levels of soluble solids in all varieties. The fruit firmness of all varieties but three were comparable to Athena (Table 2). Nun26367MEM had greater flesh firmness than all varieties with the exception of Durawest and Samoa (Table 2).

During the early harvest window (July 16-22), Athena had greater fruit number and greater total fruit weight as compared to all varieties except Aphrodite (Table 3). During the middle harvest window (July 24-29) Wrangler had the greatest fruit number and had comparable or greater total fruit weight as compared to the other varieties (Table 4). Other varieties comparable to industry standards during the middle harvest window included Fantasista and Sweet East. During the late harvest window (July 31-August 5) Nun26367MEM had greater or comparable total fruit per plot and fruit weight per plot relative to other varieties (Table 5). Aside from Athena and Aphrodite, Maxi East, and NUN26367MEM combined earliness with high soluble solids.

In a season difficult for producing many vegetable crops, yields from the industry standards, Athena and Aphrodite exemplify why they have come to be standards. However, variety selection can largely be dictated by market. Based on this season's results, wholesalers should likely continue with Athena and Aphrodite, however last year AC9000 performed well (Saha and Hanks, 2014). For direct marketers, such as those selling at farm markets, other varieties might be considered. Many of the Tuscan types are of excellent quality and have been comparable in terms of yield, including Wrangler and Orange Sherbet. Wrangler is smaller than many varieties, but customers might overlook this after tasting it.

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Table 1. Yield of cantaloupe varieties, 2015.

Variety	Seed Company	Average Fruit Weight (lb)	Number of Fruit per Plot[z]	Total Fruit Weight (lb) per Plot	Number of Fruit per Acre	Total Fruit Weight (lb) per Acre
Wrangler	HL	3.2g	45 a[y]	142 bcd	6,490 a	20,500 bcd
Athena	SY	4.7e	44 a	205 a	6,340 a	29,800 a
Fantasista	AT	4.0f	41 a	163 bc	5,950 a	23,700 bc
Aphrodite	SY	5.5cd	31 b	173 ab	4,550 b	25,100 ab
Sweet East	NH	5.8c	28 bc	161 bc	4,070 bc	23,400 bc
Maxi East	NH	6.3b	21 cd	133 cde	3,050 cd	19,300 cde
NUN 26367 MEM	NH	7.1a	20 d	142 bcd	2,900 d	20,700 bcd
Orange Sherbet	SM	5.6cd	17 de	97 e	2,520 de	14,100 e
Samoa	HM	6.3b	17 de	105 de	2,420 de	15,300 de
Durawest	NH	5.4d	11 e	59 f	1,600 e	8,500 f

[z]Plot size: 300 ft^2.
[y]Means in columns separated by Fisher's least significant test ($P \leq 0.05$), means with same letter are not significantly different.

Table 2. Fruit quality of cantaloupe varieties, 2015.

Variety	Seed Company	Brix (% Soluble Solids)	Seed Cavity			Overall	
			Length (in)	Width (in)	Firmness (lbs-force)	Length (in)	Width (in)
Maxi East	NH	12.4 a[z]	4.9 bc	3.0 cd	3.1 cde	8.3 abc	6.7 abc
Orange Sherbet	SM	11.8 ab	5.9 a	3.1 ab	3.8 bcd	8.3 a	6.2 d
Wrangler	HL	11.7 ab	4.5 c	2.2 e	2.9 de	6.8 d	5.3 e
Aphrodite	SY	11.7 ab	4.7 bc	3.4 a	2.4 e	7.3 cd	6.8 a
Sweet East	NH	11.4 abc	5.2 b	2.6 d	3.5 bcde	8.1 ab	6.6 abcd
Fantasista	AT	11.3 abc	4.8 bc	2.5 de	3.2 cde	7.0 d	5.6 e

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Table 2 *(continued)*

Variety	Seed Company	Brix (% Soluble Solids)	Seed Cavity			Overall	
			Length (in)	Width (in)	Firmness (lbs-force)	Length (in)	Width (in)
Durawest	NH	11.1 bc	5.0 bc	2.8 cd	4.5 ab	7.6 bc	6.4 bcd
Athena	SY	11.0 bc	4.4 c	2.7 cd	3.1 cde	7.2 cd	6.3 cd
NUN 26367 MEM	NH	10.7 bc	4.8 bc	2.2 e	5.4 a	8.1 ab	6.9 a
Samoa	HM	10.3 c	5.8 a	3.0 bc	4.3 abc	8.3 a	6.7 ab

[z]Means in columns separated by Fisher's least significant test ($P \leq 0.05$), means with same letter are not significantly different.

Table 3. Early cantaloupe harvest per plot[z], 2015 — Early (July 16-July 22), three harvests.

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
Athena	SY	7.0 a[y]	29.5 a	4.2 b
Aphrodite	SY	3.3 b	18.8 ab	5.6 ab
Maxi East	NH	2.0 bc	9.2 bcd	4.7 b
NUN 26367 MEM	NH	1.7 bc	13.3 bc	7.8 a
Durawest	NH	1.0 bc	4.3 cd	4.4 b
Fantasista	AT	1.0 bc	4.4 cd	4.2 b
Orange Sherbet	SM	0.3 c	1.5 cd	4.6. b
Samoa	HM	0.3 c	1.8 cd	5.5 b
Sweet East	NH	0.0 c	0.0 d	0.0 c
Wrangler	HL	0.0 c	0.0 d	0.0 c

[z]Plot size: 300 ft^2.
[y]Means in columns separated by Fisher's least significant test ($P \leq 0.05$), means with same letter are not significantly different.

Table 4. Middle cantaloupe harvest per plot[z], 2015 — Middle (July 24-July 29), three harvests.

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
Wrangler	HL	32.0 a[y]	103.5 ab	3.2 f
Fantasista	AT	27.7 ab	113.6 a	4.2 e
Athena	SY	22.7 bc	111.8 a	5.0 d
Aphrodite	SY	22.0 bc	121.9 a	5.5 bcd
Sweet East	NH	16.3 cd	93.2 abc	5.8 abc
Orange Sherbet	SM	11.7 de	65.1 cd	5.5 cd
Samoa	HM	11.0 def	69.8 bcd	6.3 ab
Maxi East	NH	6.0 efg	39.7 de	6.3 a
NUN 26367 MEM	NH	4.0 fg	23.9 e	6.1 abc
Durawest	NH	3.0 g	14.4 e	4.8 de

[z]Plot size: 300 ft^2.
[y]Means in columns separated by Fisher's least significant test ($P \leq 0.05$), means with same letter are not significantly different.

Table 5. Late cantaloupe harvest per plot[z], 2015 — Late (July 31-August 5), three harvests.

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
NUN 26367 MEM	NH	14.3 a[y]	105.3 a	7.4 a
Athena	SY	14.0 a	64.0 bc	4.6 e
Maxi East	NH	13.0 a	84.1 ab	6.5 b
Wrangler	HL	12.7 ab	38.0 cd	3.0 g
Fantasista	AT	12.3 ab	45.1 cd	3.7 f
Sweet East	NH	11.7 abc	68.2 bc	5.8 bcd
Durawest	NH	7.0 bcd	40.1 cd	5.7 cd

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Table 5 *(continued)*

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
Aphrodite	SY	6.0 cd	32.3 d	5.3 d
Orange Sherbet	SM	5.3 d	30.7 d	5.8 bcd
Samoa	HM	5.3 d	33.4 d	6.3 bc

[z]Plot size: 300 ft^2.
[y]Means in columns separated by Fisher's least significant test ($P \leq 0.05$), means with same letter are not significantly different.

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