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In Kentucky, cantaloupe (*Cucumis melo* L.) production is the fifth largest for fresh market vegetables with respect to area of production. In 2013, cantaloupe was grown on 618 acres accounting for 9% of the total fresh market vegetable acreage (USDA, 2013). Cantaloupe is grown in various areas across the state, most often in the same areas that are also producing watermelon. These would include, but are not limited to Casey, Lincoln, Hart, Allen, and Daviess counties. There is also potential for increased production, particularly in central and western Kentucky that are near the large industry in southern Indiana. However, moving into wholesale production has many challenges. In particular, netted cantaloupe has more challenges than other crops with respect to food safety. Additionally, with a large majority of sales occurring at the farm market, there is an opportunity to produce unique melons or grow varieties that might not be utilized by a wholesale producer. Variety selection is one of the primary decisions producers make each season to meet their needs with respect to high yield, resistance to abiotic disorders (e.g., fruit splitting), and good internal qualities such as soluble solids. Harvest maturity for timing of market windows is also generally a consideration for producers. Aphrodite and Athena are the most commonly used varieties currently in the Midwest, including Kentucky and Indiana. The objective of the experiment was to evaluate nine cantaloupe varieties and one honeydew grown under Midwestern U.S. growing conditions at the University of Kentucky Horticulture Research Farm in Lexington, KY.

Materials and Methods

The experiment was established when the seeds of nine cantaloupe and one honeydew varieties were sown in 50-cell black seedling flats (Landmark Plastic, Akron, OH) on April 18, 2014. The seedling media used was Jiffy-Mix #17 (Jiffy Products of America, Lorain, Ohio). All varieties were transplanted in the field in their designated plots based on the randomized complete block design on May 19, 2014. Experimental plots were 50 feet in length. Rows were spaced on 6-foot centers with 30-inch in-row spacing. There were three replicates of each variety and 20 plants in each plot.

Preplant broadcast fertilization consisted of 109 lbs of urea (46-0-0) and 100 lbs of sulfate of potash (0-0-50) per acre based on soil nutrient analysis and fertility recommendations of the ID-36 *Vegetable Production Guide for Commercial Growers* (Bessin, et al., 2014). Raised beds were formed and covered in black plastic mulch (4 ft x 1 mil, Filmtech Plastics of the Sigma Plastics Group, Lyndhurst, NJ), while drip tape (8-inch emitter spacing, 30 gph/100 ft, Aqua Traxx, The Toro Company, Bloomington, MN) was installed under the plastic to allow for irrigation during the season as needed. Fertigation applications at 10 lbs N per acre were made alternating calcium nitrate and potassium nitrate weekly from June 4 to August 7 utilizing the schedule provided in the ID-36 (Bessin, et al., 2014). Weeds on shoulders of the beds were weeded by hand and with the use of a scuffle hoe. Additionally, vines were turned back on to the plastic weekly from June 9 to June 30 to keep varieties separated and to also allow for cultivation of row middles for weed management.

The MELCAST disease forecasting system was utilized to determine the timing of preventative fungicide sprays. In some seasons that can result in a reduction of two or three fungicide

applications (Egel and Latin, 2012). Fungicide selection and proper rotation of modes of action were done per the recommendations of the ID-36 *Vegetable Production Guide for Commercial Growers* (Bessin, et al., 2014). Imidacloprid was applied in the transplant water for management of cucumber beetles which vector bacterial wilt. Scouting was conducted on a weekly basis for arthropod pests. Insecticide and/or miticide applications were made based on the scouting report.

Fruit were harvested three times per week for a total of twelve harvests from July 18 to August 18, weighing each fruit individually. Nine fruit from each variety (three from each replication) were evaluated for internal quality including percent soluble solids, size, and firmness over the course of the season. Soluble solids were measured using a refractometer (RF-12, Extech Instruments, Nashua, New Hampshire). Fruit firmness was measured using an analog penetrometer (FT, Wagner Instruments, Greenwich, Connecticut). Yield data was analyzed by Fisher's least significant difference test using SAS statistical programs (SAS Institute, Cary, NC.)

Results and Discussion

Overall, yields in 2014 were slightly higher relative to the 2013 trial, ranging from 3,969-12,439 fruit per acre, as compared to 3,630-8,808 fruit per acre last season (Table 1) (Saha and Sutterer, 2013). Likely, the site differences and the use of weekly fertigation could have been the cause for the higher yields in 2014 relative to 2013. Average fruit weight ranged from 6.0-9.4 pounds amongst the varieties (Table 2).

Aphrodite and NUN 26287 had greater average fruit weight, 9.0 and 9.4 pounds, respectively, compared to the other eight varieties (Table 1). Majus and NUN 7609 had smaller fruit, 6.1 and 6.0 pounds, respectively, compared to seven other varieties (Table 1). The remaining varieties such as Athena, were generally in the range of 7 pounds per fruit. The honeydew variety, 252 HQ, had greater yield (12,439 fruit per acre) compared to all other varieties (Table 1). There were no significant differences for number of fruit per acre among the cantaloupe varieties with the exception of VAR 351, which had significantly lower yield with respect to total weight and fruit number per acre (Table 1). From a practical perspective, the majority of the cantaloupe varieties had similar yield as the typical standards, Athena and Aphrodite.

Variety 7609 had higher brix (12.8 %) compared to five varieties in the trial (Table 2). Varieties that did not differ significantly from 7609 with respect to brix include Majus, 9000, Var 351, and Athena. With the exception of NUN26287, all varieties had greater than 11 % brix, which is considered reasonable for market (Table 2). Fruit firmness ranged from 3.0-6.3 lbs-force among the varieties in the trial (Table 2). Sunny Dee had greater fruit firmness (6.3 lbs-force) compared to five other varieties (Table 2). Regarding harvest maturity, no varieties had as many number of fruit per plot as Athena (24 fruit per plot) in the early harvest period (Table 3). Only Tirreno and Var 351 had fewer fruit per plot compared to 9000 and 252HQ during the middle harvest period (Table 4). However, Tirreno had greater number of fruit per plot in the late harvest period compared to six other cantaloupe varieties (Table 5).

Based on yields and fruit quality, there are multiple varieties that are comparable to Athena and Aphrodite. Examples of varieties would include 7609 and 9000 that had yields and quality comparable to the standards as well as similar exterior appearances of netting and no sutures. These would likely fit well with the wholesale or produce auction markets. Somewhat unique varieties with sutures, sometimes referred to as Tuscan melons, that had comparable yield and good fruit quality would include Majus, Tirreno, and Sunny Dee. These have excellent quality

but may be better suited to direct sales such as farmers markets. Similar to last season, there were significant periods of cool and wet weather, which seemed to delay maturity of the crop.

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Literature Cited

Bessin R., K. Seebold, S. Saha, S. Wright, and J. Strang, 2014. *2014-15 Vegetable Production Guide for Commercial Growers* (ID-36). Lexington: University of Kentucky College of Agriculture, Food, and Environment. Retrieved October 16, 2014, from www2.ca.uky.edu/agc/pubs/id/id36/id36.pdf.

Egel, D. and R. Latin, 2012. *Vegetable Diseases: Foliar Disease Control Using MELCAST* (Purdue Extension publication BP-67W). West Lafayette, IN: Purdue Extension. Retrieved October 16, 2014, from www.extension.purdue.edu/extmedia/BP/BP-67-W.pdf.

Saha, S.K. and L. Sutterer, 2013. Southwest Indiana Muskmelon Variety Trial, 2013. pp. 25-31. In: E.Maynard (ed.) *Midwest Vegetable Trial Report for 2013*. West Lafayette, IN: Purdue University.

United States Department of Agriculture, 2013. National Agricultural Statistics Service. 2012 Census. Retrieved October 16, 2014, from www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/Kentucky/st21_1_065_065.pdf.

Table 1. Yield of cantaloupe varieties, 2014.

Variety	Seed Company	Average Fruit Weight (lb)	Number of Fruit Per Plot[1]	Total Fruit Weight (lb per plot)	Number of Fruit Per Acre	Total Fruit Weight (lb per acre)
NUN 26287	Nunhems	9.4 a[2]	66.7 b	628.8 a	9,680 b	91,30 a
Aphrodite	Syngenta	9.0 a	67.7 b	612.4 ab	9,825 b	88,920 ab
VAR. 351	Nunhems	7.7 b	27.3 c	212.3 d	3,969 c	30,820 d
252HQ	Nunhems	7.6 b	85.7 a	652.4 a	12,439 a	94,727 a
Athena	Syngenta	7.2 bc	65.0 b	465.1 c	9,438 b	67,538 c
Tirreno	Rupp	7.1 bc	69.0 b	489.1 bc	10,019 b	71,011 bc
9000	Nunhems	7.1 bc	68.7 b	484.2 bc	9,970 b	70,305 bc
Sunny Dee	Nunhems	6.7 cd	66.3 b	444.5 c	9,632 b	64,536 c
Majus	Rupp	6.1 d	60.4 b	365.8 c	8,767 b	53,117 c
7609	Nunhems	6.0 d	63.0 b	378.4 c	9,148 b	54,945 c

[1]Plot size: 300 ft^2.
[2]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, 2014.

Variety	Seed Company	Brix (% soluble solids)	Seed Cavity		Firmness (lbs-force)	Overall	
			Length (in)	Width (in)		Length (in)	Width (in)
7609	Nunhems	12.8 a[1]	4.7 d	2.6 de	5.3 ab	6.3 f	2.48 f
Majus	Rupp	12.6 ab	4.8 d	3.1 bc	3.9 de	6.3 f	2.47 f
9000	Nunhems	12.4 abc	5.0 cd	2.7 d	3.7 de	6.7 de	2.64 de
VAR. 351	Nunhems	11.9 abcd	5.9 a	2.6 de	5.4 ab	6.9 cd	2.71 cd
Athena	Syngenta	11.6 abcd	5.3 bc	3.3 ab	3.0 e	7.0 bcd	2.75 bcd
252HQ	Nunhems	11.4 bcd	4.7 d	3.4 ab	5.5 ab	7.7 a	3.05 a
Sunny Dee	Nunhems	11.3 bcde	3.9 e	2.3 e	6.3 a	5.7 g	2.24 g
Tirreno	Rupp	11.2 cde	5.2 bcd	2.8 cd	5.4 ab	6.4 ef	2.53 ef
Aphrodite	Syngenta	11.1 de	5.7 ab	3.5 a	4.0 cd	7.2 bc	2.83 bc
NUN 26287	Nunhems	10.0 e	5.9 a	2.8 cd	4.9 bc	7.3 b	2.88 b

[1]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[1], 2014 — Early (July 18-July 25), 4 harvests.

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
Athena	Syngenta	24.0 a[2]	153.9 a	6.4 abc
Sunny Dee	Nunhems	16.0 b	75.6 c	4.8 bcd
Majus	Rupp	16.0 b	93.1 bc	5.8 abc
Aphrodite	Syngenta	14.3 bc	124.4 a	8.7 a
Tirreno	Rupp	9.3 c	58.3 cd	6.2 abc
252HQ	Nunhems	3.0 d	21.3 de	6.9 ab
NUN 26287	Nunhems	2.7 d	20.0 de	8.1 a
7609	Nunhems	0.7 d	3.4 e	3.4 cd
VAR. 351	Nunhems	0.3 d	2.4 e	2.4 de
9000	Nunhems	0.0 d	0.0 e	0.0 e

[1]Plot size: 300 ft^2.

[2]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[1], 2014 — Middle (July 28-August 4), 4 harvests.

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
9000	Nunhems	27.7 a[2]	194.7 ab	7.1 cde
252HQ	Nunhems	27.3 a	230.0 a	8.4 b
Athena	Syngenta	25.3 ab	188.8 ab	7.5 bcd
Sunny Dee	Nunhems	24.3 ab	164.5 ab	6.8 de
Aphrodite	Syngenta	23.0 ab	230.1 a	9.9 a
NUN 26287	Nunhems	22.7 ab	222.3 a	9.7 a
Majus	Rupp	21.3 ab	136.6 bc	6.4 e
7609	Nunhems	21.3 ab	134.8 bc	6.4 e
Tirreno	Rupp	19.3 b	148.8 bc	7.7 bc
VAR. 351	Nunhems	10.7 c	84.7 c	7.9 bc

[1]Plot size: 300 ft^2.
[2]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[1], 2014 — Late (August 6-August 18), 4 harvests.

Variety	Seed Company	Number of Fruit	Total Fruit Weight (lb)	Average Fruit Weight (lb)
252HQ	Nunhems	31.0 a[2]	192.4 a	6.2 cd
Tirreno	Rupp	30.3 ab	191.4 a	6.3 cd
Aphrodite	Syngenta	21.7 bc	152.3 ab	6.9 bc
NUN 26287	Nunhems	21.3 bc	184.1 a	8.7 a
7609	Nunhems	20.3 c	108.8 bc	5.4 ef
Majus	Rupp	18.0 c	92.6 bcd	5.2 f
Sunny Dee	Nunhems	17.7 c	115.5 bc	6.5 bcd
Athena	Syngenta	14.3 cd	87.6 cd	6.0 de
9000	Nunhems	13.3 cd	94.8 bcd	7.1 b
VAR. 351	Nunhems	6.0 d	42.9 d	7.1 b

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