

## LONG SHELF-LIFE MUSKMELON CULTIVAR EVALUATION

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**ABSTRACT:** Eight entries of muskmelon were evaluated for yield in a replicated trial during the summer of 2001 at the North Mississippi Research & Extension Center in Verona. The experimental design was a randomized complete block with four replications and plot size was 15 plants. Melons were harvested at full slip. Sunex 7204 produced the greatest yield of marketable melons (48,900 lb/ac), but its yield was not significantly different from five other entries. Only 'Voyager I' and Sunex 7208 produced yields significantly lower than Sunex 7204. There were also significant differences among entries for number of marketable melons per acre, which ranged from 7,400 melons/ac for Sunex 7208 to 12,800 melons/ac for 'Super 45.' Entries with the greatest percentage of early yield were Sunex 7207 (61 %) and 'Athena' (58 %) and those with the lowest were 'Voyager I' (5 %), Sunex 7204 (16%), and Sunex 7208 (18 %). As expected, two entries with eastern-type melons produced significantly larger melons than the remaining six entries with western-type melons. Average weight of marketable melons in this study ranged from 3.1 lb for ACX 6222 (western) to 5.0 lb for 'SuperSun' (eastern). Average soluble solids content ranged from 10.8 for 'SuperSun' to 13.0 for Sunex 7204. Soluble solids content of Sunex 7204 was significantly greater than all other entries except 'Voyager I.' Marketable yield was greatly affected by the number of unmarketable melons produced by each entry. Entries with the highest yield produced the lowest percentage of unmarketable melons. Conversely, entries with the lowest yield generally produced the greatest percentage of unmarketable melons. Relative number of unmarketable melons ranged from 20 % for Sunex 7204 to 46 % for 'Voyager I.' The most important cause of unmarketable melons was cracking or splitting of a melon's external surface. Cracking may have been more serious than normal due to harvest of melons at full slip. Entries with the lowest percentage of unmarketable melons also had the lowest percentage of cracked melons. Cull categories of rotten, sunscald, and small accounted for a much lower percentage of unmarketable melons. Rotten (or diseased) melons ranged from 2 % for Sunex 7204 to 12 % for Sunex 7208. Sunscald melons ranged from 0 % for 'SuperSun' to 14 % for 'Super 45.' ACX 6222, at 5 %, produced the greatest number of small melons (< 2 lb).

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**KEY WORDS:** Muskmelon cultivars, cantaloupe, *Cucumis melo*, shelf life, soluble solids content.

**MATERIALS AND METHODS:** Eight muskmelon entries were seeded into 606 trays in a greenhouse on 21 March 2001 in Starkville, Miss. Seedlings were planted to the field in by hand on 10 April 2001. Transplants were spaced 2 ft apart in plots 30 ft long making a total of 15 plants per plot and providing about 12 ft<sup>2</sup> per plant. The experimental design was a randomized complete block with four replications.

Seed were obtained from the following sources: 'Athena' from Chesmore Seed Company; 'SuperSun' from W. Atlee Burpee Company; ACX 6222 from Abbott and Cobb, Inc.; 'Super 45' from Willhite Seed Company; Sunex 7204, 7207, and 7208 and 'Voyager I' from Sunseeds.

The study was located on the "upland" soils (Ora fine sandy loam) of the Verona experiment station. Plant beds were formed six inches high and 30 in across the top with a press-pan-type bed shaper. Beds were spaced 6 ft apart, center to center. Preplant fertilizer was placed in the plant bed during formation at the rate of 80 lb N, 150 lb P<sub>2</sub>O<sub>5</sub>, and 200 lb K<sub>2</sub>O per acre. Black plastic mulch and drip tape, rated at 0.3 gal/min/100 ft at 10 psi, was applied immediately after bed formation. Curbit EC (ethalfluralin) herbicide was used to control weeds between the plastic-covered rows.

Water and/or fertilizer solution was applied through the drip tape to supply at least one acre-inch of irrigation per week. Soluble fertilizer was applied twice by injecting a concentrated solution of NH<sub>4</sub>NO<sub>3</sub> when vines began to run

and at first harvest. Soluble fertilizer applications supplied an additional 40 lb N per acre. The insecticides Asana XL (esfenvalerate), Pounce 3.2EC (permethrin), or Thiodan EC (endosulfan), were mixed with the fungicides Bravo WS (chlorothalonil) or Quadris (azoxystrobin) and sprayed on a 7 to 10 day schedule for insect and disease control. Applications of Bravo and Quadris were alternated every other week.

Melons were harvested once a week from 21 June to 7 July for a total of 6 harvests. Melons were harvested at full slip. The purpose of harvesting at full slip was to evaluate melons for quality after storage (data not presented in this report). Melons from each plot were weighed individually. At least 3 melons from each plot were tested during the study for soluble solids content with a hand-held refractometer.

Number of marketable melons and total weight of marketable melons per acre were statistically compared by using the General Linear Model procedure in SAS. Average marketable melon weight and soluble sugar content were compared by using the Mixed procedure in SAS. Only melons weighing 2.0 lb or greater were included in the analyses of marketable yield.

## **RESULTS AND DISCUSSION:**

Sunex 7204 produced the greatest yield of marketable melons (48,900 lb/ac), but its yield was not significantly different from five out of the remaining seven entries (Table 1). Only 'Voyager I' and Sunex 7208 produced yields significantly lower than Sunex 7204. Tables 1 and 2 list entries in descending order according to marketable yield (lb/ac). There were also significant differences among entries for number of marketable melons per acre, which ranged from 7,400 melons/ac for Sunex 7208 to 12,800 melons/ac for 'Super 45.'

Early yield was calculated as the portion of total marketable yield obtained in the first two harvests. Earliness can be a desirable trait. In this study, there were wide variations in earliness among the entries (Table 1). Entries with the greatest percentage of early yield were Sunex 7207 (61 %) and 'Athena' (58 %). In addition to being early, these entries were among the highest yielding. The latest entries were 'Voyager I' (5 %) and Sunex 7208 (18 %), both of which were among the lowest yielding entries, and Sunex 7204 (16%), which was the highest yielding entry.

As expected, two entries with eastern-type melons produced significantly larger melons than the remaining six entries with western-type melons. Average weight of marketable melons in this study ranged from 3.1 lb for ACX 6222 (western) to 5.0 lb for 'SuperSun' (eastern).

Soluble solids content is an indirect measure of sugar content or "sweetness." Average soluble solids content ranged from 10.8 for 'SuperSun' to 13.0 for Sunex 7204 (Table 1). Soluble solids content of Sunex 7204 was significantly greater than all other entries except 'Voyager I.'

It is clear from Table 2 that marketable yield was greatly affected by the number of unmarketable melons produced by each entry. Entries with the highest yield produced the lowest percentage of unmarketable melons. Conversely, entries with the lowest yield generally produced the highest percentage of unmarketable melons. Relative number of unmarketable melons ranged from 20 % for Sunex 7204 to 46 % for 'Voyager I.' The cause of the greatest number of unmarketable melons was cracking or splitting of the melon's external surface. Entries with the lowest percentage of unmarketable melons also had the lowest percentage of cracked melons. It is possible that the number of cracked melons would be reduced if melons were harvested at half slip instead of full slip. Cull categories of rotten or diseased, sunscald, and small accounted for a much lower percentage of unmarketable melons than the cull category of cracked. Rotten melons ranged from 2 % for Sunex 7204 to 12 % for Sunex 7208. Sunscald melons ranged from 0 % for 'SuperSun' to 14 % for 'Super 45.' Entries did not produce significant numbers of small melons, except for ACX 6222 (5 %).

**Table 1.** Marketable yield, earliness, average melon weight, and soluble solids content of eight entries of muskmelon. All entries except ‘Athena’ and ‘Super 45’ are marketed as long-shelf life melons.

Entry	Type	Yield <sup>1</sup> (lb/ac)	Yield <sup>1</sup> (melons/ac)	Early yield (% of total) <sup>2</sup>	Early yield (% of total) <sup>2</sup>	Size <sup>1</sup> (lb/melon)	Soluble solids (%) <sup>3</sup>
Sunex 7204	Western	<b>48,900</b>	<b>12,200</b>	16	0.386	4.0	<b>13.0</b>
Sunex 7207	Western	<b>47,500</b>	<b>11,700</b>	<b>61</b>	<b>0.893</b>	4.1	11.0
Athena	Eastern	<b>45,600</b>	9,200	<b>58</b>	<b>0.863</b>	<b>4.9</b>	11.6
Super 45	Western	<b>40,000</b>	<b>12,800</b>	43	0.714	3.1	11.6
SuperSun	Eastern	<b>39,500</b>	7,900	31	0.587	<b>5.0</b>	10.8
ACX 6222	Western	<b>39,300</b>	<b>12,500</b>	35	0.633	3.1	11.6
Voyager I	Western	32,600	7,900	5	0.217	4.1	<b>12.0</b>
Sunex 7208	Western	26,900	7,400	18	0.425	3.6	11.2
LSD <sup>4</sup>		12,100	2,700	12	0.157	0.3	1.0

<sup>1</sup> Values of yield and size are based on marketable melons 2.0 lb or greater. Yield based on plant population of 3630 plants per acre (12 ft<sup>2</sup> per plant). Rows spaced 6.0 ft apart with plants 2.0 ft apart in the row. Simple means reported except for size, which is least squares means.

<sup>2</sup> Earliness is yield in pounds of the first two harvests out of a total of six. Simple means reported. Statistical comparisons performed with percent data and with square root and arcsine transformation. Transformed data presented because significance was slightly different than that of percent data.

<sup>3</sup> Average soluble solids content of at least three samples from each of four replications. Least squares means.

<sup>4</sup> Least Significant Difference (LSD) at  $P=0.05$ . Treatments not significantly different (NS).

**Table 2.** Relative number of unmarketable melons of eight entries of muskmelon<sup>1</sup>. All entries except ‘Athena’ and ‘Super 45’ are marketed as long-shelf life melons.

Entry	Type	Unmarketable <sup>2</sup> (%)	Cracked <sup>3</sup> (%)	Rot <sup>4</sup> (%)	Rot <sup>4</sup> (trans)	Sunscald <sup>5</sup> (%)	Sunscald <sup>5</sup> (trans)	Small <sup>6</sup> (%)
Sunex 7204	Western	<b>20</b>	<b>10</b>	2	<b>0.106</b>	8	0.229	<b>0</b>
Sunex 7207	Western	<b>21</b>	7	8	0.274	<b>5</b>	0.196	<b>1</b>
Athena	Eastern	<b>21</b>	<b>10</b>	8	0.252	<b>2</b>	<b>0.101</b>	<b>1</b>
Super 45	Western	<b>29</b>	7	7	0.254	14	0.372	<b>2</b>
SuperSun	Eastern	43	33	9	0.303	<b>0</b>	<b>0.000</b>	<b>0</b>
ACX 6222	Western	<b>30</b>	<b>6</b>	9	0.308	8	0.279	5
Voyager I	Western	46	34	6	<b>0.222</b>	<b>3</b>	<b>0.108</b>	<b>0</b>
Sunex 7208	Western	44	27	12	0.346	<b>3</b>	<b>0.156</b>	<b>1</b>
LSD <sup>7</sup>		14	9	NS	0.125	7	0.181	2

<sup>1</sup> Percentage data based on number of melons, not pounds. Statistical comparisons performed with percent data and after square root and arcsine transformation. Transformed data shown only if statistically different than percent data.

<sup>2</sup> Relative number unmarketable melons (cracked, rotten, sunscald, and small) as percent of total marketable yield.

<sup>3</sup> Relative number of cracked (split) melons as a percent of total yield.

<sup>4</sup> Relative number of rotten or diseased melons as a percent of total marketable yield.

<sup>5</sup> Relative number of sunscald melons as a percent of total marketable yield.

<sup>6</sup> Relative number of small melons (< 2.0 lb) as a percent of total marketable yield.

<sup>7</sup> Least Significant Difference (LSD) at  $P=0.05$ . Treatments not significantly different (NS).