# Midwest Muskmelon Variety Trial in Southwest Indiana — 2011

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## Introduction

Although muskmelons in Indiana may not be produced on the same scale as some states such as California and Arizona, they still remain important as a contributor to the overall agricultural economy in the state. Indiana is ranked fifth in the nation in terms of acres harvested (2,300) and it is ranked sixth in total value ($6.2 million) (USDA, 2011).

Overall, management of muskmelon production entails a number of different practices to optimize yield and fruit quality. One of the primary starting points for a commercial producer is to start with good genetics for both yield and quality. The objective of this project is to evaluate the growth and yield of 25 muskmelon varieties grown under southwestern Indiana conditions.

## Materials and Methods

On April 12, 2011, the experiment was established when seeds of each variety were sown. This season there were 25 varieties submitted from various seed companies. Seeds were started in 50-cell black seedling flats (Crop Tech, Vincennes, IN) using a peat based soilless media, Jiffy-Mix Grower's Choice Plus (Jiffy Products of America, Lorain, Ohio). The experimental field was prepared by tillage, application of fertilizer material, formation of raised beds, and installation of black plastic mulch and drip tape. Fertilizer was applied at a rate of 350 lbs (46-0-0), 100 lbs (0-0-60), and 200 lbs of pelletized lime. Planting density was 22 plants per plot, with plot dimensions of 6 feet x 55 feet. In-row plant spacing was 2.5 feet.

On May 12, 2011, transplants were planted in the field in the appropriate plots. The experimental design was a randomized complete block with three replicates. Plants were harvested three times per week over four weeks for a total of twelve harvests beginning July 18 and ending on August 12. Fruit number, weight, and average fruit weight were all collected during harvest. Additionally nine fruit from each variety (three fruit per replicate) were evaluated for various quality parameters such as soluble solids, fruit firmness, seed cavity length, seed cavity width, overall fruit length, overall fruit width, and rind thickness. Data were analyzed by Fisher's least significant difference test using SAS statistical programs (SAS Institute, Cary, NC.)

## Results

In 2011, Wrangler had the greatest total fruit per acre (9,504) as compared to 21 of 25 varieties evaluated this season (Table 1). More importantly, it had a greater yield than Aphrodite which is a standard variety grown throughout southwest Indiana and other muskmelon growing regions. However one must also consider that the average fruit weight for Wrangler was 3.0 lbs less than Aphrodite, hence it produces a smaller fruit (Table 1). The market and brokers determine if the smaller fruit are acceptable to the consumer. Although commercial producers are paid per piece as opposed to weight, they must produce a product that is accepted in the market.

ACX428ES and Solstice had the greatest numerical average fruit weights (7.8 lbs and 7.7 lbs respectively) and were statistically greater than 22 of the 25 varieties (Table 1). Average fruit weight varied from 2.0 to 7.8 lbs and average fruit weight per acre varied from 4,248 lbs to 49,963 lbs (Table 1).

Orange Beauty had the highest numerical soluble solid content (12.3 %), which was significantly greater than 22 of the varieties evaluated this season (Table 2). However, Orange Beauty was one of the lowest yielding varieties (3,080 fruit/acre) due to extreme fruit cracking (Table 1). The other varieties with high soluble solid content relative to the other varieties included ACX3477, Florida, and ACX 779 (Table 2). There was some variation in fruit firmness amongst varieties with E1032 and E1029 being some of the firmest at 10.9 and 10.4 lbs-force, respectively (Table 2). Fruit firmness of muskmelon varieties ranged from 5.4 to 10.9 lbs-force (Table 2). There were no significant differences in rind thickness.

Although yield is likely one of the muskmelon traits of great importance, it ultimately takes a combination of traits including those that lead to good internal fruit quality. Based on the results in comparison with some popular local varieties, Yosemite had fruit numbers and soluble solids comparable to Athena and greater fruit number compared to Aphrodite (Tables 1 and 2). E1029 was another variety that performed well overall and was also comparable to Athena and Aphrodite with respect to fruit number per acre and soluble solids content (Tables 1 and 2).

## Acknowledgements

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## Literature Cited

United States Department of Agriculture, 2011. National Agricultural Statistics Service. Vegetables 2010 Summary. http://usda01.library.cornell.edu/usda/current/VegeSumm/VegeSumm-01-27-2011.pdf.

**Table 1.** Harvest data of muskmelon varieties, 2011.

| Variety | Seed Company | Total Fruit Number per Plot[1,2] | Total Fruit Number per Acre | Ave. Fruit Weight (lb) | Total Weight per Plot (lb) | Total Weight per Acre (lb) | % early season | % mid season | % late season |
|---|---|---|---|---|---|---|---|---|---|
| Wrangler | Hollar | 72.0 a | 9,504 a | 3.9 jk | 278.9 e | 36,811 e | 53.7 | 29.6 | 16.7 |
| E1032 | American Takii | 68.7 ab | 9,064 ab | 4.9 ghi | 338.9 abcde | 44,729 abcde | 32.5 | 22.8 | 44.7 |
| Yosemite | Seminis | 63.3 abc | 8,360 abc | 4.4 ij | 278.9 e | 36,814 e | 30.5 | 41.6 | 27.9 |
| Atitlan | Seminis | 61.3 abcd | 8,096 abcd | 4.7 hi | 284.9 de | 37,600 de | 13.0 | 48.9 | 38.0 |
| Bucanero | Seminis | 60.7 bcde | 8,008 bcde | 5.4 efg | 327.8 abcde | 43,275 abcde | 30.8 | 37.9 | 31.3 |
| Tirreno | Rupp | 60.0 bcdef | 7,920 bcdef | 5.0 fgh | 304.1 cde | 40,142 cde | 38.9 | 36.7 | 24.4 |
| E1029 | American Takii | 59.3 bcdefg | 7,832 bcdefg | 5.2 efgh | 308.7 cde | 40,752 cde | 20.8 | 27.0 | 52.2 |
| E1016 | American Takii | 59.0 bcdefgh | 7,788 bcdefgh | 5.0 fgh | 295.2 de | 38,962 de | 43.5 | 23.7 | 32.8 |
| Athena | Syngenta | 52.7 cdefghi | 6,952 cdefghi | 5.5 efg | 289.0 de | 38,147 de | 55.7 | 25.9 | 18.4 |
| ACR 4067 ES | Abbott & Cobb | 51.3 defghi | 6,776 defghi | 7.4 ab | 381.7 a | 50,380 a | 42.2 | 40.9 | 16.9 |
| Atlantis | Sakata | 50.7 defghi | 6,688 defghi | 5.7 de | 289.5 de | 38,215 de | 36.8 | 24.3 | 38.8 |
| ACX 4276 XWS | Abbott & Cobb | 50.3 efghi | 6,644 efghi | 6.2 d | 314.2 cde | 41,475 cde | 7.3 | 37.7 | 55.0 |
| E1023 | American Takii | 50.3 efghi | 6,644 efghi | 5.6 ef | 281.0 e | 37,088 e | 41.1 | 21.2 | 37.7 |
| E1030 | American Takii | 50.0 efghi | 6,600 efghi | 5.7 de | 279.7 e | 36,918 e | 20.7 | 32.7 | 46.7 |
| Origami | Harris Moran | 49.7 fghi | 6,556 fghi | 6.9 b | 344.4 abcd | 45,458 abcd | 63.1 | 22.1 | 14.8 |
| ACX 428 ES | Abbott & Cobb | 48.7 ghi | 6,424 ghi | 7.8 a | 378.51 ab | 49,963 ab | 24.0 | 53.4 | 22.6 |
| Aphrodite | Syngenta | 48.3 hi | 6,380 hi | 6.9 bc | 336.5 abcde | 44,412 abcde | 59.3 | 19.3 | 21.4 |
| Samoa | Harris Moran | 48.0 i | 6,336 i | 6.2 d | 299.4 de | 39,520 de | 15.3 | 53.5 | 31.3 |
| Solstice | Rupp | 47.3 i | 6,248 i | 7.7 a | 361.9 abc | 47,775 abc | 76.1 | 12.7 | 11.3 |
| Ariel | Syngenta | 47.0 i | 6,204 i | 6.2 d | 292.2 de | 38,574 de | 67.4 | 16.3 | 16.3 |
| ACX 779 | Abbott & Cobb | 46.7 i | 6,160 i | 6.8 bc | 319.0 bcde | 42,107 bcde | 7.9 | 37.1 | 55.0 |
| ACX 3477 XES | Abbott & Cobb | 45.7 i | 6,028 i | 6.3 cd | 287.6 de | 37,961 de | 16.8 | 38.7 | 44.5 |
| ACR 4017 ESX | Abbott & Cobb | 43.3 i | 5,720 i | 7.1 b | 307.8 cde | 40,626 cde | 41.5 | 36.9 | 21.5 |
| Orange Beauty | Seminis | 23.3 j | 3,080 j | 3.5 k | 80.6 f | 10,632 f | 65.7 | 32.9 | 1.4 |
| Florida | Seminis | 16.0 j | 2,112 j | 2.0 l | 32.2 f | 4,248 f | 0.0 | 100.0 | 0.0 |

[1]Plot size=330ft$^2$.
[2]Means in columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.

**Table 2.** Internal fruit quality of muskmelon varieties, 2011.

| Variety | Seed Company | Brix[1,2] | Firmness (lbs-force)[3] | Rind Thickness (in) | Seed Cavity Length (in) | Seed Cavity Width (in) | Fruit Length (in) | Fruit Width (in) |
|---|---|---|---|---|---|---|---|---|
| Orange Beauty | Seminis | 12.3 a | 9.8 abc | 0.4 | 3.2 hi | 2.3 | 6.0 kl | 5.9 b |
| ACX 3477 XES | Abbott & Cobb | 11.5 ab | 5.6 h | 0.3 | 4.8 cde | 3.0 | 7.4 fghi | 6.8 b |
| Florida | Seminis | 10.9 abc | 9.6 abc | 0.2 | 3.1 i | 2.2 | 5.5 l | 5.0 b |
| ACX 779 | Abbott & Cobb | 10.7 bcd | 8.8 abcdef | 0.4 | 4.9 bcde | 2.4 | 8.3 abcde | 7.1 b |
| ACX 4276 XWS | Abbott & Cobb | 10.4 bcde | 8.4 bcdefg | 0.3 | 4.9 bcde | 2.9 | 7.9 defg | 7.1 b |
| E1023 | American Takii | 10.1 bcdef | 9.5 abcd | 0.4 | 5.3 abc | 2.5 | 8.0 cdefg | 6.0 b |
| ACR 4017 ESX | Abbott & Cobb | 9.9 cdefg | 6.4 gh | 0.4 | 5.6 ab | 3.0 | 8.7 ab | 7.2 b |
| Aphrodite | Syngenta | 9.7 cdefgh | 8.0 cdefg | 0.4 | 5.2 abcd | 3.7 | 8.1 bcdef | 7.7 b |
| Atlantis | Sakata | 9.7 cdefgh | 6.9 fgh | 0.3 | 4.9 cde | 3.1 | 7.6 efghi | 13.0 a |
| Ariel | Syngenta | 9.6 cdefghi | 7.9 cdefg | 0.3 | 4.7 cde | 3.3 | 7.7 efgh | 7.4 b |
| Yosemite | Seminis | 9.6 cdefghi | 6.5 gh | 0.3 | 4.0 fg | 2.7 | 6.6 jk | 6.1 b |
| E1030 | American Takii | 9.4 defghi | 8.9 abcdef | 0.3 | 4.5 ef | 2.8 | 7.4 ghi | 6.3 b |
| Athena | Syngenta | 9.2 efghi | 7.4 defgh | 0.5 | 4.8 cde | 3.1 | 7.6 efgh | 6.8 b |
| E1029 | American Takii | 9.2 efghi | 10.4 ab | 0.3 | 4.4 efg | 2.8 | 7.0 hij | 6.0 b |
| Solstice | Rupp | 9.1 efghij | 5.4 h | 0.4 | 5.6 ab | 3.3 | 8.9 a | 7.6 b |
| E1016 | American Takii | 9.0 efghij | 8.6 bcdef | 0.4 | 4.6 def | 5.2 | 7.4 fghi | 6.1 b |
| E1032 | American Takii | 8.9 fghij | 10.9 a | 0.4 | 3.8 gh | 2.6 | 7.0 hij | 6.0 b |
| ACR 4067 ES | Abbott & Cobb | 8.9 fghij | 7.8 cdefg | 0.4 | 5.2 abcd | 3.0 | 8.3 abcde | 7.4 b |
| ACX 428 ES | Abbott & Cobb | 8.8 fghij | 8.4 bcdefg | 0.4 | 5.6 a | 2.9 | 8.7 abc | 7.1 b |
| Atitlan | Seminis | 8.7 fghij | 9.2 abcde | 0.4 | 4.4 efg | 2.6 | 6.9 ij | 6.2 b |
| Wrangler | Hollar | 8.5 ghij | 7.9 cdefg | 0.3 | 4.3 efg | 2.4 | 7.0 hij | 5.8 b |
| Bucanero | Seminis | 8.3 hij | 9.9 abc | 0.4 | 4.4 efg | 2.5 | 7.4 ghi | 6.5 b |
| Samoa | Harris Moran | 8.1 ij | 8.5 bcdefg | 0.4 | 5.6 a | 2.7 | 8.3 abcde | 6.7 b |
| Origami | Harris Moran | 7.7 j | 9.2 abcde | 0.4 | 5.7 a | 3.0 | 8.5 abcd | 7.2 b |
| Tirreno | Rupp | 7.7 j | 7.4 efgh | 0.4 | 4.7 cde | 2.6 | 7.2 hij | 6.4 b |

[1]Brix: percent soluble solids. Higher values related to higher sugar content in the fruit.
[2]Means in columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.
[3]Firmness of the flesh of the melon. Higher value is associated with higher firmness.