

Evaluation of Pumpkin Varieties for Warmer Portions of Tennessee, 2000

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Interpretative Summary

Eight experimental and five named pumpkin varieties were evaluated in a growers field of Franklin Co., TN. This portion of the state tends to be warmer than much of the pumpkin production region on the Cumberland Plateau. Weeds were a significant problem, especially spiny amaranth and redroot pigweed. In addition to the weed problem, non-uniform moisture and poor disease control also contributed to severe stress resulting in poor yields, fruit size, and fruit quality. However, 'Magic Lantern', a recommended commercial variety produced high yields of small fruit. An experimental variety 'HMX 6689' produced the greatest numbers of large fruit. Fruit quality of these varieties were very acceptable.

'HMX 6689' is similar to 'Magic Lantern' and 'Merlin' in appearance, quality, and disease tolerance. All three varieties exhibit tolerance to powdery mildew. However, 'HMX 6689' appears to produce larger fruit, which would be advantageous for the retail sales market. Many growers like 'Magic Lantern', but when relying on natural rainfall are having problems producing the desired size (15 to 20 lb). Therefore, many growers are considering trickle irrigation in conjunction with the production of 'Magic Lantern'. When this report was written, Harris Moran Seed Company had decided to advance 'HMX 6689' to pre-commercial status and increase seed availability.

Introduction

Although a significant amount of production is located in the higher elevations of Walden's Ridge and the Cumberland Plateau, pumpkins are grown throughout the state of Tennessee. The primary commercial variety, 'Howden', has not performed well at lower elevations. 'Howden' appears to be very sensitive to high temperatures and stress in general. Cucurbit crops generally produce more male flowers than female flowers, often 10 male for every female flower. However, 'Howden' has been observed to produce more than 100 male flowers for each female flower. Over the last eight to ten years, the yield of 'Howden' has decreased significantly throughout the state. This yield decrease, along with poor fruit quality, has been even more noticeable at lower elevations. Therefore, an experiment was conducted on a grower farm in Franklin Co., TN to evaluate the yield and fruit quality of eight experimental or numbered and five named pumpkin varieties in a warmer part of the state.

Materials and Methods

A conventional tilled seedbed was prepared prior to planting. Fertilizer was broadcast at 30 lb/A of N, P₂O₅, and K₂O prior to final tillage. Eight numbered varieties ('HMX 4694', 'HMX 9697', 'HMX 0682', 'HMX 0683', 'HMX 0681', 'HMX 6689', 'HMX 0684', 'HMX 0684', and 'HMX 9698') and five named varieties ('Merlin', 'Magic Lantern', 'Jackpot', 'Howden', and 'Howden

Biggie') were planted in Dallas Felton's pumpkin field located near Decherd, TN in Franklin Co. Plots consisted of 2 rows 4 ft apart, with 20 ft between 2 row plots. Each row contained 4 hills, 4 ft apart. Therefore, a plot consisted of 8 hills spaced 4 ft apart (320 ft²). This row configuration was used to facilitate fungicide and insecticide application. Weed control consisted of Command 4EC at 0.75 pint/A plus Prefar 4E at 4.5 quarts/A applied preemergence, immediately after the plots were planted on June 16, 2000. Few fungicide and insecticide applications were made. Plots were harvested on September 22, 2000. Fruit were counted, weighed, and evaluated for fruit characteristics. Fruit were divided into 4 size categories; less than 10 lb, 10 to 15 lb, 15 to 20 lb, and greater than 20 lb. Representative fruit from each plot were measured for length and diameter, as well as evaluated for quality. Stems were rated on a scale of 1 to 10; where 1 = no stem and 10 = a long, thick dark green stem. Fruit color was rated on a scale of 1 to 10; where 1 = white fruit color and 10 = dark orange fruit color.

Results and Discussion

Rain began to fall soon after the plot area was planted, and the early part of the season received adequate rainfall. However, much of the production season was hot and dry. Weed control was very poor. Various species of pigweed, primarily spiny amaranth and redroot pigweed, were uncontrolled. Due to the poor weed control, as well as inadequate spray equipment, disease control was also poor. Overall, yield and fruit size were only a fraction of what these varieties are capable of producing. However, the data supports trends observed in recent variety trials at other locations.

'Magic Lantern' produced significantly more fruit (number and weight) weighing less than 10 lb than all of the varieties evaluated (Table 1 and 2). 'Magic Lantern' has consistently produced high numbers of fruit over the last several years. 'HMX 6689' produced few small fruit; and produced significantly more fruit (number and weight) weighing between 15 and 20 lb than any other variety. Again, 'Magic Lantern' produced the greatest number of total fruit, and significantly greater numbers of total fruit than all varieties except 'HMX 4694' and 'HMX 0684'. Although not significantly different, 'Magic Lantern' and 'HMX 6689' produced the greatest tonnage of the varieties evaluated.

Within various size classes, average fruit weight did not differ significantly among varieties (Table 3). However, when averaged across total production, 'HMX 6689' produced the largest overall average fruit weight, while 'HMX 9697' produced the smallest fruit.

'HMX 4694' and 'Magic Lantern' produced fruit receiving the highest stem ratings (Table 4). 'Howden', which generally produces good stems, along with 'HMX 0682' were rated as having poor stem quality. Fruit of 'HMX 4694' were significantly darker than fruit of all cultivars except 'Merlin', 'Magic Lantern', and 'HMX 6689'. Fruit of 'Jackpot' were the lightest in color. As is often the case, 'Howden Biggie' produced the longest fruit and the greatest length to diameter ratio. 'HMX 6689' produced fruit with the largest diameter, while 'HMX 9697' produced the smallest fruit in length and diameter. 'HMX 4694' produced the flattest fruit.

‘HMX 6689’ is similar to ‘Magic Lantern’ and ‘Merlin’ in appearance, quality, and disease tolerance. All three varieties exhibit tolerance to powdery mildew. However, ‘HMX 6689’ appears to produce larger fruit, which would be advantageous for the retail sales market. Many growers like ‘Magic Lantern’, but when relying on natural rainfall, are having problems producing the desired size (15 to 20 lb). Therefore, many growers are considering trickle irrigation in conjunction with the production of ‘Magic Lantern’. When this report was written, Harris Moran Seed Company had decided to advance ‘HMX 6689’ to pre-commercial status and increase seed availability.

Table 1. Yield (number of fruit/A) of selected pumpkin varieties evaluated in Franklin Co., TN, 2000.

| Variety | Yield < 10 lb. (no./A) | Yield 10 - 15 lb. (no./A) | Yield 15 to 20 lb. (no./A) | Yield > 20 lb. (no./A) | Yield Total (no./A) |
|---------------|------------------------------|---------------------------------|----------------------------------|------------------------------|---------------------------|
| HMX 0681 | 307 cd ² | 340 | 34 b | 0 | 681 bc |
| HMX 0682 | 375 bcd | 374 | 0 b | 0 | 749 bc |
| HMX 0683 | 272 cd | 102 | 0 b | 0 | 374 bc |
| HMX 0684 | 511 bcd | 408 | 0 b | 0 | 919 ab |
| HMX 4694 | 681 b | 238 | 0 b | 0 | 919 ab |
| HMX 6689 | 171 d | 170 | 272 a | 102 | 715 bc |
| HMX 9697 | 238 d | 0 | 0 b | 0 | 238 c |
| HMX 9698 | 307 cd | 340 | 0 b | 34 | 681 bc |
| Howden | 272 cd | 204 | 0 b | 0 | 476 bc |
| Howden Biggie | 374 bcd | 34 | 68 b | 68 | 544 bc |
| Jackpot | 272 cd | 375 | 0 b | 0 | 647 bc |
| Magic Lantern | 1,327 a | 136 | 0 b | 0 | 1,463 a |

| | | | | | |
|--------|--------|----|------|---|--------|
| Merlin | 613 bc | 68 | 34 b | 0 | 715 bc |
|--------|--------|----|------|---|--------|

^z Means within a column followed by the same letter are not significantly different at the 0.05 level of probability, Fishers Protected F. Absence of letters indicates no significant difference at the 0.05 level of probability.

Table 2. Yield (tons of fruit/A) of selected pumpkin varieties evaluated in Franklin Co., TN, 2000.

| Variety | Yield < 10 lb. (tons/A) | Yield 10 - 15 lb. (tons/A) | Yield 15 to 20 lb. (tons/A) | Yield > 20 lb. (tons/A) | Yield Total (tons/A) |
|---------------|-------------------------------|----------------------------------|-----------------------------------|-------------------------------|----------------------------|
| HMX 0681 | 1.2 bc ^z | 1.9 | 0.3 b | 0.0 | 3.4 |
| HMX 0682 | 1.3 bc | 2.2 | 0.0 b | 0.0 | 3.5 |
| HMX 0683 | 0.9 bc | 0.6 | 0.0 b | 0.0 | 1.5 |
| HMX 0684 | 1.7 bc | 2.6 | 0.0 b | 0.0 | 4.3 |
| HMX 4694 | 2.1 b | 1.4 | 0.0 b | 0.0 | 3.5 |
| HMX 6689 | 0.7 c | 1.1 | 2.3 a | 1.2 | 5.3 |
| HMX 9697 | 0.6 c | 0.0 | 0.0 b | 0.0 | 0.6 |
| HMX 9698 | 1.1 bc | 2.1 | 0.0 b | 0.4 | 3.6 |
| Howden | 1.1 bc | 1.3 | 0.0 b | 0.0 | 2.4 |
| Howden Biggie | 1.4 bc | 0.2 | 0.6 b | 0.9 | 3.1 |
| Jackpot | 1.1 bc | 2.2 | 0.0 b | 0.0 | 3.3 |
| Magic Lantern | 4.2 a | 0.8 | 0.0 b | 0.0 | 5.0 |
| Merlin | 1.7 bc | 0.4 | 0.3 b | 0.0 | 2.4 |

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Table 3. Average fruit weight (lb/fruit) of selected pumpkin varieties evaluated in Franklin Co., TN, 2000.

| Variety | Yield < 10 lb. (lb/fruit) | Yield 10 - 15 lb. (lb/fruit) | Yield 15 to 20 lb. (lb/fruit) | Yield > 20 lb. (lb/fruit) | Yield Total (lb/fruit) |
|---------------|---------------------------------|------------------------------------|-------------------------------------|---------------------------------|------------------------------|
| HMX 0681 | 6.6 ^z | 11.4 | 17.0 | ---- | 10.5 ab |
| HMX 0682 | 7.0 | 11.4 | ---- | ---- | 8.6 bcd |
| HMX 0683 | 7.0 | 11.6 | ---- | ---- | 7.6 bcd |
| HMX 0684 | 6.4 | 12.8 | ---- | ---- | 9.5 bcd |
| HMX 4694 | 5.8 | 11.1 | ---- | ---- | 7.5 bcd |
| HMX 6689 | 7.7 | 13.5 | 17.4 | 22.7 | 13.6 a |
| HMX 9697 | 5.7 | ---- | ---- | ---- | 5.7 d |
| HMX 9698 | 7.3 | 12.2 | ---- | 21.1 | 10.1 abc |
| Howden | 8.6 | 12.5 | ---- | ---- | 10.5 ab |
| Howden Biggie | 7.5 | 13.8 | 17.8 | 25.5 | 9.8 abc |
| Jackpot | 7.8 | 11.4 | ---- | ---- | 10.0 abc |
| Magic Lantern | 6.5 | 11.6 | ---- | ---- | 7.0 bcd |
| Merlin | 5.4 | 11.2 | 18.3 | ---- | 6.4 cd |

^z Means within a column followed by the same letter are not significantly different at the 0.05 level of probability, Fishers Protected F. Absence of letters indicates no significant difference at the 0.05 level of probability.

Table 4. Fruit characteristics of selected pumpkin varieties evaluated in Franklin Co., TN, 2000.

| Variety | Stem Rating (1 - 10) ^x | Color Rating (1 - 10) ^y | Fruit Length (inches) | Fruit Diameter (inches) | Length/ Diameter (ratio) |
|---------------|---|--|-----------------------------|-------------------------------|--------------------------------|
| HMX 0681 | 7.0 ab | 6.0 cd | 9.4 abcd | 10.4 ab | 0.90 de |
| HMX 0682 | 6.0 b | 6.5 bcd | 8.3 def | 9.1 cdef | 0.91 de |
| HMX 0683 | 7.0 ab | 6.5 bcd | 9.0 bcdef | 9.5 abcde | 0.95 cde |
| HMX 0684 | 6.5 ab | 6.0 cd | 9.3 bcd | 9.6 abcd | 0.97 cde |
| HMX 4694 | 7.5 a ^z | 8.0 a | 8.6 cdef | 9.9 abc | 0.88 e |
| HMX 6689 | 7.0 ab | 7.0 abc | 10.0 ab | 10.7 a | 0.94 cde |
| HMX 9697 | 6.8 ab | 6.0 cd | 7.8 f | 8.2 f | 0.95 cde |
| HMX 9698 | 6.5 ab | 6.0 cd | 9.9 abc | 9.5 abcde | 1.04 bc |
| Howden | 6.0 b | 6.0 cd | 9.1 bcde | 9.2 bcdef | 1.00 cd |
| Howden Biggie | 6.5 ab | 5.5 d | 10.6 a | 8.3 ef | 1.28 a |
| Jackpot | 6.5 ab | 4.0 e | 10.1 ab | 9.2 bcdef | 1.11 b |
| Magic Lantern | 7.5 a | 7.0 abc | 7.9 ef | 8.5 def | 0.93 de |
| Merlin | 7.3 ab | 7.5 ab | 7.9 ef | 8.8 cdef | 0.90 de |

^x Stem rating of 1 to 10; where 1 = no stem and 10 = long, thick dark green stem.

^y Color rating of 1 to 10; where 1 = white fruit color and 10 = dark orange color.

^z Means within a column followed by the same letter are not significantly different at the 0.05 level of probability, Fishers Protected F.

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This research represents one season's data and does not constitute recommendations. After sufficient data is collected over the appropriate number of seasons, final recommendations will be made through research and extension publications.