

Annette Wszelaki¹, Jonathan Schultheis², Brad Thompson², Chris Leek³ and Terry Kelley⁴

¹Department of Plant Sciences, University of Tennessee

²Department of Horticultural Science, North Carolina State University

³NCSU Mountain Research Station

⁴Formerly with the Department of Horticulture, University of Georgia

Introduction:

Tennessee has consistently ranked in the top 10 states for pumpkin production in the U.S. Pumpkins aren't just orange and round anymore! Today you can find white and even blue pumpkins, in addition to many shades of orange. Sizes range from mini to giant and shape can be flat, oval round or oblong. In order to maintain their Top 10 status and to meet the demands of the changing market, producers are constantly looking for new and improved traditional jack-o'-lantern varieties, as well as unique varieties to increase farm profits.

Objective: The purpose of this trial was to compare new cultivars or advanced lines of pumpkins for yield, quality and adaptation to growing conditions in the Southeast.

Methods:

This experiment was conducted at the NCSU Mountain Research Station in Waynesville, NC. Seeds were planted 26 June. Thirty-two varieties of pumpkins were evaluated in this study. For six of those, only one plot was planted per variety for observational purposes. Four plots were planted for each of the remaining 26 varieties. These plots were randomly assigned within each replicate to account for field variability. Plot size was one 24-foot long row with 6 plants. In-row spacing was 4 feet, with 12 foot spacing between row middles and between plots. Hills were replanted one and two weeks after initial planting to maximize plant stands in plots.

Fertilizer (72 lbs N, 184 lbs P₂O₅ and 50 lbs K₂O per acre) was applied pre-plant on 4 June; another 28 lbs N and 18 lbs K₂O per acre were later side dressed on 23 July. A total of 100 lbs N, 184 lbs P₂O₅ and 68 lbs K₂O was applied per acre for the season.

For weed control, Curbit (1.25 pints/acre), Command (8 ounces/acre), and Roundup Weathermax (1.5% solution) were applied on 27 June and 12 July. For insect control, preventative sprays began 10 July and were applied weekly thereafter (17 and 25 July; 1, 8, 16, and 31 August; 12, 21, and 28 September), alternating between Baythroid and Asana to prevent pests from developing resistance. Fungal diseases were controlled with a rotation of Bravo, Nova, and Quadris. Fungicides were applied on the following dates: 17 and 25 July; 1, 8, 16, 23, and 31 August; and 5, 12, 21, and 28 September.

Pumpkins were harvested on 10 – 11 October. The cultivars were sorted into six size classes: giant (> 50 lbs), extra large (40-50 lbs), large (25-40), medium (10-25), small (5-10 lbs) and mini (< 5 lbs). The characteristics measured included yield (weight and number of pumpkins), percent of pumpkins mature at harvest, and average pumpkin weight, length and width. Yield per acre was calculated based on the number of pumpkins per plot and the combined weight of all pumpkins in each plot. Each pumpkin was weighed individually in each plot. Length and width were measured on five pumpkins per plot. Several quality characteristics were rated subjectively, including pumpkin color, shape and suturing, and handle length, thickness, and

attachment. Powdery mildew severity was also rated subjectively. The rating scales are explained below in their appropriate tables.

Results:

In the giant size class (>50 lbs), two varieties were evaluated. Prizewinner had the heavy-weight in the trial, weighing in at over 142 lbs. It averaged almost 67 lbs/pumpkin (Table 1). This variety is an Atlantic Giant-type but smaller in size and with brighter orange color (Table 2).

In the extra large size class, we looked at two white varieties and New Moon out yielded Full Moon. It averaged just over 40 lbs/pumpkin and has a nice, smooth skin, with yields over 3,000 fruit/acre.

In the large category we looked at 5 traditional jack-o'-lantern types. The top yielders by weight were Harvest Time and Gold Medal, while Aladdin and Gold Medal had the highest number of pumpkin/acre. Aladdin and Gold Medal averaged just over 25 lbs/pumpkin and Harvest Time just over 30 lbs/pumpkin. All three of these were round in shape and had nice bright orange color. Dependable was unique in this class with an oval shape and averaged 35 lbs/pumpkin.

Eleven varieties were evaluated in the medium-size class. Pro Gold 510 and Magician both yielded over 5,000 fruit per acre. Magician was the smallest in this class at just over 15 lbs/pumpkin, while Pro Gold 510 averaged just under 25 lbs/pumpkin. Pro Gold 510 received a powdery mildew rating of moderate to severe, however, this did not affect its yield, as it was also a top yielder by weight along with Warlock. Warlock has a semi-hard shell, which aids in its field holding capacity and ship-ability. It also has a taller shape, rough skin and deep orange color.

For small pumpkins (between 5-10 lbs/pumpkin), we looked at 3 varieties. Lumina is a flat, white pumpkin that averaged 7.5 lbs/pumpkin and yielded nearly 5,000 pumpkins/ acre. Hobbit is a small, orange pumpkin and was the most variable of all the varieties in size. Pumpkins of this variety ranged in size from just under 2 lbs to just under 20 lbs.

Mini-pumpkins were classified as those weighing under 2 lbs/pumpkin. Gooligan is a white mini, averaging just over ½ lb/pumpkin and 10,000 pumpkins/acre. Bumpkin is its orange colored counterpart, averaging 1 lb/pumpkin and 30,000 pumpkins/acre.

A couple other varieties deserve mention, but were planted only for observation. Jarrahdale comes from Australia and is a flat pumpkin with bluish-gray skin. It is also edible- often called a gourmet pumpkin. Jarrahdale averaged just over 10 lbs/pumpkin. Finally, Lil' Pumpkemon is a mini-pumpkin that is cream colored with orange stripes down its sutures, and could be renamed the Volunteer Mini. It averages about 1 lb/pumpkin, with nearly 20,000 pumpkins/acre and would be sure to sell out at a home game!

Acknowledgements:

We appreciate the hard work of the Mountain Research Station Farm Crew, and are grateful to Harris Moran Seed Company, Hollar Seed Company, Johnny's Selected Seed, Rupp Seed, Seminis Seed Company, and Twilley Seed for their financial support.

UT, NCSU and UGA 2007 Pumpkin Trial

Table 1. Pumpkin cultivar trial in Waynesville, N.C. 2007. Total yield (tons/Acre) and number of harvested fruit per acre, including the average fruit size, number of green fruit per acre, and the percent immature fruit at harvest.

| Size | Cultivar | Seed Company | Total Wt./ Acre | Total No. / Acre | No. Immature / Acre | % Immature | Avg lb./ fruit |
|--------------------|-----------------------|---------------------|----------------------------|-----------------------------|--------------------------------|-----------------------|---------------------------|
| Giant | Prizewinner | Seminis | 73 | 2269 | 529 | 21 | 64.3 |
| | Wyatt's Wonder | Rupp | 22 | 908 | 151 | 33 | 48.0 |
| Extra large | Full Moon | Rupp | 42 | 1928 | 454 | 22 | 44.0 |
| | New Moon | Hollar | 66 | 3214 | 189 | 4 | 41.3 |
| Large | Dependable | Twilley | 53 | 2987 | 303 | 11 | 35.7 |
| | Harvest Time | Twilley | 63 | 3895 | 1134 | 28 | 32.3 |
| | Super Herc | Harris Moran | 52 | 3630 | 1210 | 34 | 28.6 |
| | Aladdin | Harris Moran | 56 | 4197 | 2004 | 41 | 26.9 |
| | Gold Medal | Rupp | 60 | 4613 | 1286 | 30 | 26.1 |
| Medium | Pro Gold 510 | Twilley | 62 | 5256 | 1323 | 25 | 23.7 |
| | HSR 4700 | Hollar | 40 | 3365 | 1134 | 30 | 23.7 |
| | Warlock (HMX 6685) | Harris Moran | 49 | 4159 | 2307 | 58 | 23.6 |
| | Howden | Hollar | 40 | 3706 | 1097 | 31 | 21.4 |
| | 20 Karat Gold | Rupp | 42 | 4197 | 870 | 19 | 19.9 |
| | Gold Challenger | Rupp | 32 | 3214 | 529 | 15 | 19.7 |
| | Magic Wand (HMX 6686) | Harris Moran | 33 | 3706 | 908 | 25 | 17.9 |
| | Magic Lantern | Harris Moran | 40 | 4500 | 1248 | 28 | 17.8 |
| | Gladiator | Harris Moran | 27 | 3025 | 1097 | 35 | 17.6 |
| | EXT 8111 | Seminis | 24 | 3176 | 454 | 15 | 15.2 |
| Magician | Harris Moran | 38 | 5143 | 1210 | 23 | 14.7 | |
| Small | Valenciano | Rupp / Johnny's | 14 | 2836 | 416 | 16 | 9.9 |
| | Hobbit | Twilley | 15 | 4046 | 945 | 26 | 7.4 |
| | Lumina | Twilley | 18 | 4991 | 870 | 19 | 7.2 |
| Mini | Mini-Treat | Twilley | 4 | 6806 | 0 | 0 | 1.1 |
| | Bumpkin | Harris Moran | 15 | 29948 | 0 | 0 | 1.0 |
| | Gooligan | Twilley | 3 | 10058 | 0 | 0 | 0.6 |

Table 2. Pumpkin cultivar trial. Fruit quality and measurements. **Waynesville, N.C., 2007.**

| Cultivar | PM Rating ¹ | Color ² | Fruit Shape ³ | Fruit Suturing ⁴ | Handle ⁵ | | | Vine Type ⁶ | Fruit ⁷ | | |
|--------------------|------------------------|--------------------|--------------------------|-----------------------------|---------------------|------------|-----------|------------------------|--------------------|-------|-----------------|
| | | | | | Length | Attachment | Thickness | | Length | Width | LD ⁷ |
| Prizewinner | 1.0 | 3.5 | 4.4 | 2.5 | 2.8 | 3.5 | 5.3 | 4.0 | 18.7 | 21.1 | 0.89 |
| Wyatt's Wonder | 1.3 | 3.5 | 4.1 | 2.0 | 2.0 | 4.7 | 3.3 | 3.8 | 14.9 | 17.3 | 0.86 |
| Full Moon | 0.7 | 0.0 | 4.9 | 2.0 | 3.2 | 3.7 | 4.0 | 4.0 | 16.4 | 18.4 | 0.89 |
| New Moon | 0.5 | 0.0 | 3.8 | 2.0 | 2.3 | 3.3 | 3.8 | 4.0 | 13.3 | 17.7 | 0.75 |
| Dependable | 1.5 | 6.0 | 7.8 | 2.5 | 4.8 | 5.8 | 8.5 | 4.0 | 16.7 | 13.3 | 1.26 |
| Harvest Time | 1.8 | 5.5 | 6.1 | 4.5 | 5.0 | 5.8 | 7.5 | 4.0 | 14.4 | 14.7 | 0.98 |
| Super Herc | 0.4 | 7.6 | 6.0 | 5.0 | 5.8 | 8.3 | 7.0 | 3.8 | 14.5 | 13.8 | 1.05 |
| Aladdin | 1.0 | 7.3 | 5.9 | 2.3 | 6.3 | 6.8 | 5.8 | 3.5 | 12.7 | 13.4 | 0.95 |
| Gold Medal | 2.0 | 6.8 | 5.5 | 3.3 | 4.4 | 6.4 | 7.3 | 4.0 | 12.9 | 13.2 | 0.98 |
| Pro Gold 510 | 2.5 | 6.1 | 6.0 | 4.3 | 4.8 | 6.3 | 5.0 | 4.0 | 12.7 | 13.3 | 0.95 |
| Warlock (HMX 6685) | 1.4 | 8.0 | 5.6 | 2.5 | 5.8 | 6.8 | 7.3 | 3.1 | 13.5 | 13.5 | 1.00 |
| HSR 4700 | 1.5 | 5.3 | 5.0 | 1.5 | 5.8 | 6.5 | 6.5 | 2.8 | 11.7 | 13.1 | 0.89 |
| Howden | 2.4 | 0.0 | 5.3 | 3.8 | 4.9 | 6.8 | 6.1 | 4.0 | 11.4 | 13.1 | 0.88 |
| 20 Karat Gold | 2.0 | 6.6 | 4.9 | 3.0 | 5.8 | 6.5 | 6.8 | 3.6 | 11.2 | 12.2 | 0.92 |
| Gladiator | 1.0 | 7.0 | 5.1 | 3.5 | 6.3 | 7.0 | 7.0 | 3.1 | 11.1 | 12.8 | 0.86 |
| Gold Challenger | 2.3 | 6.8 | 5.1 | 3.8 | 6.5 | 7.3 | 6.5 | 3.1 | 11.0 | 11.7 | 0.94 |
| Magic Wand (HMX) | 0.3 | 7.8 | 4.5 | 3.8 | 5.5 | 7.5 | 6.8 | 3.3 | 10.3 | 11.9 | 0.86 |
| Magic Lantern | 1.5 | 7.0 | 5.1 | 3.5 | 5.5 | 6.5 | 5.8 | 3.8 | 11.0 | 11.9 | 0.93 |
| EXT 8111 | 1.4 | 5.9 | 5.0 | 2.5 | 6.5 | 6.5 | 5.5 | 2.4 | 10.1 | 11.5 | 0.87 |
| Magician | 1.0 | 7.0 | 5.0 | 3.8 | 6.0 | 6.3 | 6.5 | 4.0 | 10.2 | 11.1 | 0.91 |
| Valenciano | 0.6 | 0.0 | 2.5 | 2.5 | 3.0 | 2.8 | 5.0 | 4.0 | 6.5 | 10.0 | 0.65 |
| Lumina | 1.3 | 0.0 | 2.9 | 2.5 | 2.5 | 3.3 | 4.0 | 4.0 | 7.0 | 9.6 | 0.73 |
| Hobbit | 2.3 | 5.9 | 4.9 | 2.3 | 5.5 | 5.3 | 5.5 | 3.9 | 7.7 | 8.9 | 0.87 |
| Mini-Treat | 2.3 | 6.0 | 5.0 | 1.3 | 6.3 | 8.0 | 6.3 | 1.6 | 3.6 | 4.2 | 0.86 |
| Bumpkin | 2.5 | 5.1 | 2.0 | 2.3 | 6.0 | 5.8 | 5.3 | 3.1 | 2.5 | 4.4 | 0.58 |
| Gooligan | 1.3 | 0.0 | 1.5 | 5.5 | 4.5 | 5.5 | 3.8 | 3.1 | 2.3 | 3.7 | 0.62 |

¹ Powdery Mildew Rating Scale : 0 = none, 1 = minor, 2 = moderate, 3 = severe

² Color Scale: 0 = white, 1 = yellow, 5 = orange, 9 = burnt orange

³ Fruit Shape Rating: 1 = flat, 5 = round, 9 = tall.

⁴ Fruit Suturing: 1 = none, 5 = medium, 9 = deep.

⁵ Handle Rating: Length: 1 = short, 5 = medium, 9 = long.

Attachment: 1 = poor, 5 = average, 9 = excellent.

Thickness: 1 = thin, 5 = medium, 9 = thick.

⁶ Vine Type Rating: 1 = bush, 2 = semi-bush, 3 = semi-vine, and 4 = vine.

⁷ Fruit measurements = Individual length and width values were taken from 5 fruit per replication, (20 total), in inches.

The LD ratio was determined by dividing the length by the diameter.