Does Pumpkin Planting Date Affect Yield?

Liz Maynard

Northwest Commercial Horticulture Program
Purdue University

Presented at Illiana Vegetable Growers' School, Schererville, Ind., January 9, 2003

Pumpkins for jack-o-lantern use can be planted from the last week of May through the third week of June in the Illiana region, and probably even a week earlier and two weeks later.

Because they are harvested as mature fruit, and because they can be left in the field after mature, or stored before sale, the planting date is flexible: they don't have to be planted at a particular time in order to be harvested at a particular time.

But is there one period when it is better to plant?

Weather is one of the major things that varies with time. For pumpkins, probably the most important part of weather is the temperature. Cool temperatures slow growth, promote female flower development at a lower node, and if excessively cool, may cause chilling injury and make the plant more susceptible to disease.

Hot temperatures reduce survival of female flowers, and the combination of hot and dry may reduce pollinator activity, resulting in reduced fruit set.

Rainfall is another factor that varies during the season. The early part of the season is more likely to have adequate water than the middle of the growing season. Dry weather can slow growth and reduce fruit set.

Insect, disease and weed populations also vary with time, in some cases responding to the temperature or moisture in the weather.

This year we started research to see how planting date influences pumpkin production. After several years we hope to have enough information to determine the importance of temperature as a predictor of response to planting date, and use that information, combined with historical temperature records to determine whether one planting date would be expected to be better than another.

Trials were conducted at the Pinney-Purdue Agricultural Center in Wanatah, Indiana. Gold Medal and Magic Lantern pumpkins were seeded in the field on May 31, June 10 and June 20. Each variety was planted in a row 100 ft. long, with plants spaced 4 ft. apart in the row. There were four replications of each variety and planting date. Rows were spaced 12 ft. apart to minimize interference between rows and to make it easier to separate treatments at harvest. Standard cultural practices were used, and drip irrigation was used to supplement rainfall, but did not prevent visible symptoms of drought stress.

Pumpkins were harvested 104 to 106 days after planting on Sept. 12, 24, and Oct. 3, for the first, second and third planting dates, respectively. Pumpkins were classified as mature if they were completely orange, turning if they had begun to turn, but were not completely orange, and immature if they had not begun to turn color. Data for immature fruit are not shown. Mature and turning pumpkin fruit that were
soft due to decay or insect feeding were designated culls.

Yield per plant, number of pumpkins per plant and average weight per pumpkin are presented in Table 1. Yield of pumpkin plants that were seeded after the target date to replace seeds or plants eaten by rodents is not included in the table; nor is yield of pumpkin plants that declined in the early part of the growing season due to an unidentified wilt disease.

Table 1. Yield and number of pumpkins per plant, and average weight per pumpkin for 'Gold Medal' and 'Magic Lantern' pumpkins planted on May 31, June 10 and June 20, 2002.*

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Mature (lb./plant)</th>
<th>Mature + Turning (lb./plant)</th>
<th>Mature + Turning + Cull (lb./plant)</th>
<th>Ave. Wt. Mature (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 31</td>
<td>27.6 b</td>
<td>40.4 a</td>
<td>2.91 a</td>
<td>15.8 b</td>
</tr>
<tr>
<td>June 10</td>
<td>32.8 a</td>
<td>41.7 a</td>
<td>2.60 a</td>
<td>18.4 a</td>
</tr>
<tr>
<td>June 20</td>
<td>26.8 b</td>
<td>33.9 b</td>
<td>2.24 b</td>
<td>17.4 a</td>
</tr>
<tr>
<td>Cultivar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Medal</td>
<td>28.7</td>
<td>36.9 b</td>
<td>1.90 b</td>
<td>21.3 a</td>
</tr>
<tr>
<td>Magic Lantern</td>
<td>29.5</td>
<td>40.5 b</td>
<td>3.27 a</td>
<td>13.1 b</td>
</tr>
</tbody>
</table>

*Means followed by different letters differ significantly at the 5% confidence level according to Fisher's protected LSD.

This year the June 10th planting date yielded more than the June 20th planting date. The increase was due to an increase in number of fruit per plant rather than any change in average fruit size. The June 10th planting date also produced greater yield of mature (orange) pumpkins than the May 31st planting date. The increase was due largely to an increase in average fruit size rather than an increase in fruit number. June 10th and May 31st planting dates produced equivalent yield (lb. per plant) when marketable yield (mature+turning), or total yield (mature+turning+cull) are considered. Mature pumpkins from the June 10th and 20th planting dates were larger than those from the May 31st planting date.

Other planting date effects are not immediately apparent from this table. The percentage of marketable fruit that was fully mature (orange) was higher for the June 10th and 20th planting dates than the May 31st date. The percentage of culls was highest in the May 31st planting date. The effects of planting date were similar across the two cultivars.

Gold Medal and Magic Lantern produced similar yields, but Magic Lantern produced a greater number of smaller pumpkins.

When these results are considered with additional data collected during the season on timing of flowering and fruit set it seems likely that results may reflect the temperatures we experienced. The cool weather at the start of the season may have promoted early female flower production and early fruit set

on the May 31st planting. Those pumpkins started to develop on relatively small plants and matured early. Once mature, the plants set a second set of fruit that did not have time to mature fully before harvest. This explains the small fruit size, lower percentage of orange fruit, and possibly the higher percentage of culls, assuming that mature fruit that sit around longer are more likely to decay or be attacked by insects. The June 20th planting experienced more hot weather than the other two plantings, delaying fruit set and ultimately reducing yield. One can imagine that under different weather conditions the first or third planting date might have produced more than the second. We certainly can't know what the weather will be before planting, but we can predict the likelihood of different scenarios, and with more data on how pumpkins respond to varying temperatures we should be able to narrow down the range of optimum planting dates.