



# Pumpkins

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## Introduction

The name “pumpkin” is commonly applied to any plant in the taxonomically diverse *Cucurbita* genus that produces the characteristic yellow to orange, round fruit. Pumpkin cultivars may belong to one of several species: *Cucurbita pepo*, *C. maxima*, *C. moschata* and *C. mixta*.

## Marketing

Most pumpkins are used for ornamental purposes, with the greatest market demand from mid-September through Thanksgiving. Marketing options include roadside stands, local retailers, wholesale markets, grower marketing associations, community supported agriculture (CSA) and U-Pick. Illinois is the largest pumpkin producing state, and there is significant wholesale acreage in states bordering Kentucky: Indiana, Ohio and Tennessee. Agritourism events, including school farm tours, often feature pumpkins.

Smaller-sized and unique pumpkin varieties, including those with good eating characteristics, may appeal to many direct market customers. Higher and more stable prices can be expected from direct sale or even “pumpkin festival” sales, but this market can become saturated with too many growers. This is more likely to be the case in urban areas. Sales by smaller pumpkin growers to growers holding larger festivals may bring prices that are higher than wholesale prices. Smaller growers could also consider joint marketing efforts to attract wholesale buyers. Larger producers and those who do not have time for direct sales will need to find wholesale buyers or, in some cases, sell directly to supermarkets. Many big box stores are requiring no-till production to avoid



having to wash pumpkins; this is not an option for growers who do not have access to the proper equipment for no-till.

## Market Outlook

Pumpkins have long been part of U.S. Halloween and Thanksgiving celebrations. They are an important component of fall decorating, which now ranks second in consumer spending to Christmas decorating. Although consumer demand for pumpkins has expanded considerably in recent years, prices remained generally stable to lower as more growers entered production. Wholesale prices reflect trends in major production areas, especially Illinois. Wholesale farm prices in the states near Kentucky were reported at \$15 to \$20 per 100 pounds from 2015 to 2017. Because high-quality pumpkins are typically available in nearby regional markets, proper production and management is critical to profitably growing pumpkins on Kentucky farms.



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## Production Considerations

### *Cultivar selection*

Pumpkin fruit can vary in size from less than a pound to more than 1,000 pounds. Along with the traditional orange-yellow color, there are cultivars that produce red, white, bluish-grey or striped fruit. Varieties are also bred for specific purposes, such as carving, decorative uses, processing or baking. For example, cultivars that are suitable for carving jack-o-lanterns are normally too stringy or lack the flavor necessary for pies. While hard shell pumpkins are uncarvable, they have a very long shelf life and are easy to paint. Consideration should be given to the qualities in demand by the intended market. In addition, commercial growers should select well-adapted cultivars that have the necessary disease and pest resistance for their locale.

### *Site selection and planting*

Pumpkin is a warm-season, vining crop that typically requires a long season for production, ranging from 80-120 days weather and variety dependent. This crop grows best on well-drained, fertile soil. To help avoid some soil-borne disease problems, select fields where other cucurbit crops have not been grown for at least three years. Pumpkins are typically planted between mid-May and early June, with a mid-September harvest for wholesale marketing.

Pollination is essential for obtaining high yields of good quality fruit, and if growers don't have enough native bees, supplemental pollination by honeybees may be required. Supplemental irrigation is critical in dry summers during flowering and fruit-set. Abnormally hot weather can present problems in obtaining fruit-set.

Some growers have successfully produced pumpkins using a no-till system of either seeding or transplanting into rye stubble or a rye-legume cover crop that has been killed with herbicide. This method can eliminate the need for washing pumpkins prior to marketing, it may reduce fruit rots, and it makes an easier and cleaner field to walk in for U-Pick customers. But a cover crop will keep the soils cooler in the spring and may delay planting and slow growth, so growers

should allow more time for maturity. Also, if pumpkins are seeded there is often significant seed predation from rodents that live in the cover crop, so seeding rates need to be adjusted upward.

### *Pest management*

Insect pests of pumpkin include aphids, leafhoppers, cucumber beetles, squash vine borer, spider mites and squash bugs. Using insect traps or scouting to monitor populations can help the grower determine when and how often insecticides should be applied. Black rot, downy mildew, powdery mildew and plectosporium are the most important diseases of late summer and fall cucurbits in Kentucky. Other diseases that can cause crop losses include Fusarium wilt, yellow vine decline, and several viruses. A good fungicide

spray program is essential to produce quality fruit that will store. An air blast sprayer is commonly used on larger acreages, but for the small grower a backpack mist blower may be sufficient. Weed management is also critical for production of high quality pumpkins. This is particularly important if the grower is doing farm tours or pick-your-own as many of the most difficult weeds to manage are viny or have spines or prickles.

There are limited herbicides available so growers should plan on cultivation as one of the weed management tools.

### *Harvest and storage*

Pumpkins are hand-harvested with a sharp cutting tool when the fruit is fully mature; generally when the color deepens uniformly and the rind becomes hard. Leaving a few inches of the stem intact makes the pumpkin more attractive. In addition, pumpkins without a stem do not store as well. Handle fruit carefully to avoid injury that could lead to fruit rot. Multiple harvests over a period of three to four weeks are common. Pumpkins can be stored for two to three months at the proper temperature and relative humidity.

### **Labor requirements**

Labor needs per acre for non-irrigated pumpkins are 15 to 20 hours for production, 40 hours for harvest, and 30 hours for hauling and handling. Estimated har-



vest and handling labor, based on UK and Penn State production budgets, is around 300 pounds per hour for yields of 20,000 to 30,000 pounds per acre. An additional 10 hours per acre may be needed for black plastic and drip tape removal following harvest if they are used.

### Economic Considerations

Initial investments include land preparation and the purchase of seed or transplants. Additional start-up costs can include the installation of an irrigation system and black plastic mulch and drip tape. Larger-scale Kentucky pumpkin producers, like producers in Virginia and the Carolinas, typically grow pumpkins without irrigation. Conventional pumpkin production can generate returns above variable costs at or above \$1,000 per acre. However, returns to land and management can vary considerably, based on a producer's fixed costs (such as land rents, machinery and equipment), pumpkin yields, disease control costs, and selling price from year to year.

Pumpkins can be profitably produced at smaller scales, especially when premium prices are obtained at direct markets. A 2017 UK estimate for 700 row feet of pumpkins, producing 200 pumpkins each sold for \$5 and 50 pumpkins each sold for \$2.50, showed an estimated return to land, capital and management of \$20 to \$25 per 250 pumpkins. As in wholesale pumpkins, higher selling prices can significantly increase small-scale profitability potential at direct markets. Small-scale growers must consider their equipment needs carefully and consider that in their costs of production.

Estimated production costs in Kentucky (2017-18), for drip-irrigated pumpkins on black plastic, are \$1,200 per acre with harvesting and marketing costs at \$2,040 per acre. Total variable and fixed costs per acre are approximately \$3,745. Assuming gross returns of \$3,600, economic returns to land, capital and management would be a loss of approximately \$295 per acre. This assumes 30,000 pounds produced and sold at a price of 12 cents per pound. Pumpkin returns are very

price-sensitive; a price of 15 cents per pound would have resulted in a return to land, capital and management of about \$510 for drip-irrigated pumpkins.

### Selected Resources

- IPM Scouting Guide for Common Problems of Cucurbit Crops in Kentucky, ID-91 (University of Kentucky, 2009) <http://www.ca.uky.edu/agc/pubs/id/id91/id91.pdf>
- Kentucky Pumpkin Integrated Pest Management Grower Manual, IPM-12 (University of Kentucky, 1998) <http://ipm.ca.uky.edu/files/ipm12pum.pdf>
- Vegetable and Melon Budgets (University of Kentucky, 2017) <http://www.uky.edu/ccd/tools/budgets>
- Vegetable Production Guide for Commercial Growers, ID-36 (University of Kentucky) <http://www2.ca.uky.edu/agcomm/pubs/ID/ID36/ID36.pdf>
- Commercial Production and Management of Pumpkins and Gourds, Bulletin 1180 (University of Georgia, 2017) <http://extension.uga.edu/publications/detail.html?number=B1180>
- Organic Pumpkin and Winter Squash Marketing and Production (ATTRA, 2010) <https://attra.ncat.org/attra-pub-summaries/?pub=30>
- Pumpkins (Penn State University, 2012) <https://extension.psu.edu/pumpkin-production>
- Pumpkins (Agricultural Marketing Resource Center, 2018) <http://www.agmrc.org/commodities/products/vegetables/pumpkins.cfm>

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