



Sweet Potato

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Introduction

The terms “sweet potato” and “yam” are often used interchangeably; however, they are actually two entirely different crops. Only sweet potatoes (*Ipomoea batatas*) are grown in the U.S.; yams (*Dioscorea* spp.) are grown in the Caribbean and many other tropical areas.

Marketing

The most profitable marketing opportunities for sweet potatoes in Kentucky are through local fresh markets, such as farmers markets, direct delivery and CSA, and on-farm stands. Producers also market through local wholesale channels, selling directly from the farm to restaurants, grocers and institutional foodservice, including schools. “U-Dig” sweet potato sales, similar to U-Pick, are also possible in some areas. Sweet potato processing has grown nationally in recent years and is dominated by large processors; there are no significant processing markets available in Kentucky. Higher market prices tend to occur during the winter months; growers who are able to cure and store their crop may realize greater profitability. As of the 2018 season, there were no large-scale sweet potato curing facilities in Kentucky. Small-scale, on-farm curing is possible under properly managed conditions.

Market Outlook

U.S. sweet potato use per capita increased by about 2 pounds per person from 2006, reaching an estimated 7.2 pounds in 2016. More consumer familiarity with fresh sweet potatoes and increases in sweet potato fry consumption contribute to the increase. Sweet potatoes gained some popularity as a “lower-carb potato” in the early 2000s,



and high antioxidant levels in sweet potato skins and other health benefits have contributed to sustained consumer appeal. Sweet potato consumption is highest among Americans over 60, and sweet potatoes may have special appeal to aging, health-conscious baby boomers. White and purple flesh sweet potatoes, as well as organic sweet potatoes, are possible market niches that Kentucky growers could fill. Although it is relatively easy to grow sweet potatoes without chemicals, acquiring certified organic slips is very difficult. Wireworm and grub control will be the biggest challenges for growers hoping to grow organically. Proper site selection and timely planting and cultivation will be critical.

Production Considerations

Cultivar selection

There are hundreds of sweet potato cultivars available, including heirloom varieties. Sweet potatoes differ in such horticultural characteristics as root shape, skin color (copper, rose, red,



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white or purple), and flesh color (orange, deep orange, purple, white or cream). Flavor (sweetness) and flesh moisture can also vary. Asian and Hispanic consumers often prefer dry flesh types. Because some cultivars require the lengthy growing season found farther south, it is important to select only cultivars known to be well-adapted for the Kentucky growing season. The growing season in Eastern Kentucky is about 90 days on average and Western Kentucky has 110 days fairly consistently. Resistance to various diseases (e.g. root knot nematode, internal cork and/or Fusarium wilt) and insects (e.g. wireworm) is available in some cultivars, although the slips (vine cuttings) may be very difficult to obtain. Commercial growers should choose varieties with the qualities in demand by the intended market.

Site selection and planting

Sweet potatoes grow best on medium to light sandy soils that are well drained. While this crop can be grown in heavier soils, roots may be rough-skinned and irregular as a result. Fields high in organic matter should be avoided. Sweet potatoes should not be grown on the same land more often than once every three years. Avoid fields with a history of difficult to control perennial weeds. Also avoid sites that have had corn within the last five years to reduce the potential for wireworm damage.

Propagation is from vine cuttings commonly referred to as “slips.” While certified disease-free slips can be purchased, it is often more economical for growers to propagate their own stock, if they have their own sweet potatoes to use for starting slips. Ten to 12 bushels of disease-free sweet potatoes should be bedded to produce enough slips for 1 acre. Ordinarily, 16 to 20 square feet of bed surface will be needed for each bushel. Sweet potatoes are usually bedded about seven weeks before field-setting time.

Sweet potatoes are cold-sensitive and are planted after all danger of frost has passed. Slips may be transplanted to the field by hand, but many Kentucky growers use a one-row tobacco setter. About 15,000 transplants

(slips) are set per acre. Providing an even supply of water during the first 40 days after planting is especially important for quality root development. An uneven water supply can result in growth cracks; drought conditions may reduce yields; and excess moisture may injure roots. Additionally, watering during this critical period can help plants survive later water-related stresses.



Pest management

The main insect pests are those that feed on the roots, such as wireworms, flea beetle larvae and sweet potato weevils. Diseases include black rot and scurf, Fusarium wilt, root knot nematodes and post-harvest rots. Resistant cultivars, crop rotations, sanitation and weed management

are important tools in disease and insect management. Pesticide applications may be necessary in some seasons.

Harvest and storage

Sweet potatoes should be harvested when sufficient 6- to 8-ounce potatoes are found in the hill. A good practice is to clip the vines before harvesting so they do not get in the way during harvest, resulting in less damage to the potatoes. A turn plow or a potato plow can be used to expose the roots with the least possible injury. Potatoes are graded in the field and then placed in containers that are to be put into storage. For large-scale production, mechanical harvesting machinery must be used.

Following harvest, sweet potatoes need to undergo a curing process to promote the healing of wounds and begin the process of converting starches to sugar. Curing improves flavor and texture, as well as heals wounds from digging. It also increases storage ability, protecting roots from many storage diseases, and increases the post-storage lifetime of the root. Curing is best accomplished at a temperature of 85oF and relative humidity of 80% to 90%. After curing, sweet potatoes may be stored for four to seven months under the proper conditions, including ventilation. Sweet potatoes are cleaned prior to sale, not when they are removed from the field, because they have very tender skins. They are cleaned by brushing or washing,

and then sometimes waxed before packing into boxes, crates or baskets for market.

Labor requirements

Labor needs per acre are approximately 16 hours for production, 25 to 50 hours for harvest, and up to 50 hours for post-harvest handling. Labor times are greatly impacted by the use of harvest equipment and whether the crop will be sold fresh or require more handling during curing and storage.

Economic Considerations

Initial investments include land preparation and the purchase of “slips” or sweet potatoes for propagation. Total preharvest expenses were estimated at approximately \$1,600 per acre for 2018. Harvest and marketing costs for a 425-box yield will add approximately \$1,850 to variable costs. Total costs, including variable and fixed, are estimated at nearly \$3,700 per acre.

Since returns vary depending on actual yields and market prices, the following per acre returns to land and management are based on three different economic scenarios. Conservative estimates represent the University of Kentucky’s average cost and return estimates for production of 275 boxes U.S. #1 sold at \$11 per box, and 150 boxes U.S. #2 sold at \$6 per box. Optimistic estimates raise the sale prices to \$20 and \$12 per box.

Pessimistic \$(275)*	Conservative \$90	Optimistic \$3,090
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A small-scale sweet potato budget tool was developed by the Center for Crop Diversification using 2017 production assumptions. These estimates indicated that growers direct marketing 2,500 pounds of sweet potatoes, production from 15 100-foot rows, could potentially realize a return to land and management of approximately \$500. That estimate was based on a direct market price of \$30 per box for 32 boxes of U.S. #1 and \$15 per box for 18 boxes of U.S. #2 sweet potatoes.

**Parentheses indicate a negative number, i.e. a net loss*

Selected Resources

- Vegetable Production Guide for Commercial Growers, ID-36 (University of Kentucky)
<http://www.ca.uky.edu/agc/pubs/id/id36/id36.pdf>
- Vegetable and Melon Budgets (University of Kentucky, 2017)
<http://www.uky.edu/ccd/tools/budgets>
- Small-Scale Technology and Practices for Sweet Potato Growing in Southeast Oklahoma (Kerr Center, 2014)
<http://kerrcenter.com/wp-content/uploads/2014/03/Sweet-potato-equipment-report-2014.pdf>
- Guide to Sweetpotato Production in Alabama ANR-982 (Alabama Cooperative Extension, 2006)
<http://www.aces.edu/pubs/docs/A/ANR-0982/ANR-0982.pdf>
- Harvesting and Curing Sweetpotatoes ANR-1111 (Alabama Cooperative Extension, 2004)
<http://www.aces.edu/pubs/docs/A/ANR-1111/ANR-1111.pdf>
- Sweetpotato: Organic Production (ATTRA,2005)
<http://attra.ncat.org/attra-pub/sweetpotato.html>
- Investigating the Impact of Plant Spacing on Yields of Sweet Potato Produced in Organic Systems (Tennessee State University, 2018)
https://projects.sare.org/sare_project/gs17-175/
- Sweet Potatoes (Mississippi State University)
<http://extension.msstate.edu/agriculture/crops/sweet-potatoes>
- Estimated Costs and Returns for Sweet Potatoes (Fresh market, Irrigated) (Clemson University, 2016)
<http://www.clemson.edu/extension/agribusiness/enterprise-budget/index.html>

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