COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Sweet Potato

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. "U-Dig" sweet potato sales, similar to U-Pick, are also possible in some areas. Currently (2014) there are about 200 acres of commercial sweet potato production in the state. Sweet potato processing has grown nationally in recent years and is dominated by large processors; there are no significant processing markets available in Kentucky.

Market Outlook

U.S. sweet potato use per capita has increased significantly during the last decade and was estimated at nearly 7 pounds in 2012. This was up almost 50 percent over 2002 levels; more popularity and increases in consumption of sweet potato fries contribute to the increase. Sweet potatoes gained some popularity as a "lower-carb potato" in the early 2000's, and high antioxidant levels in sweet potato skins and other health benefits contributed to consumption staying strong after the low-carb diet craze. 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. Higher market prices occur during the winter months; growers who are able to store their crop after curing can realize greater profitability.

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, white, or purple), and flesh color (orange, deep orange, or cream). Flavor (sweetness) and flesh moisture can also vary. Dry flesh types are often preferred by Asian and Hispanic consumers. 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. 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. 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 3 years. Avoid fields with a history of difficult to control perennial weeds.

Propagation is from vine cuttings, which are 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 one acre. Ordinarily 16 to 20 square feet of bed surface will be needed for each bushel. Sweet potatoes are usually bedded about 7 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. 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 85^{o}F and relative humidity of 80 to 90 percent. After curing, sweet potatoes may be stored for 4 to 7 months under the proper conditions, including ventilation. Sweet potatoes are cleaned, either 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, 40 hours for harvest, and 40 to 50 hours for post-harvest handling.

Economic Considerations
Initial investments include land preparation and the purchase of "slips" or sweet potatoes for propagation. Total preharvest expenses are approximately $1,600 per acre. Harvest and marketing costs for a 425-box yield will add

approximately $2,000 to variable costs. Total costs, including variable and fixed, are estimated at just over $4,000 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 $20 per box and 150 boxes U.S. #2 sold at $12 per box. Such returns are in line with those experienced by a mixture of direct marketing channels in Kentucky. Large-scale production for wholesale only will result in prices closer to the $8 to $15 per box range.

Pessimistic	Conservative	Optimistic
$740	$2,895	$3,775

Selected Resources

- Vegetable Production Guide for Commercial Growers, ID-36 (University of Kentucky) http://www.ca.uky.edu/agc/pubs/id/id36/id36.htm
- Commercial Sweet Potato Production in Mississippi (Mississippi State University. 2002) http://msucares.com/pubs/publications/p1678.pdf
- Estimated Costs and Returns for Sweet Potatoes (Fresh market, Irrigated) (Clemson University) http://www.clemson.edu/extension/aes/budgets/files/sweetpotatoes-irr.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) https://attra.ncat.org/attra-pub/summaries/summary.php?pub=32

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Photo: Charles Averre, North Carolina State University, Bugwood.org **March 2014**

The Center for Crop Diversification is supported by a grant from the Kentucky Agricultural Development Fund