UK COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE

Cucumber

Introduction

The cucumber (*Cucumus sativus*) is a warm-season vining crop in the Cucurbit family. Cucumbers suitable for immediate consumption are referred to as "slicers," while those for processing are "picklers." Although there once was a large pickling cucumber industry in Kentucky, nearly all cucumbers grown commercially in the state are now for fresh market consumption.

Marketing

Cucumbers are grown in Kentucky primarily for fresh market (slicing types) rather than for processing (pickling types). Some pickling types are sold at auctions and farmers markets. Fresh market options include wholesale markets, auctions, cooperatives, community supported agriculture (CSA) subscription shares, farmers markets, and roadside stands. Sales to local retail markets, such as supermarkets and restaurants, are also an option.

Market Outlook

U.S. per capita consumption of fresh cucumbers rose about 15% (one pound per capita) from 1995 to 2005. This indicates a normal increase for quantity demanded. Consumption of cucumbers was steady from 2005 to 2009, with fresh cucumber use forecast at 6.6 pounds per capita in 2009. Prices can fluctuate, with lower prices occurring when production peaks in June. Adding value to fresh cut processing (slicing) could increase wholesale profits. A noticeable trend in the early 2010s was that restaurants showed more interest in purchasing larger lots of cucumbers for pickling at the restaurant. Kentucky's location provides access to good wholesale markets for both spring and fall slicing cucumbers. Some Kentucky growers try to capitalize on the narrow marketing window that occurs in mid-September after slicing cucumbers from northern sources have moved from the market.

Production Considerations

Site selection and planting

Cucumbers do best in well-drained soils that are high in organic matter. The soil should be plowed in the fall and then disked two or three times in early spring for a well-prepared seed bed. Land that has been in sod is very desirable. Avoid planting on a site that was treated the previous year with a triazine herbicide or that has recently had other cucurbit crops (melons, pumpkins, squash, etc.).

Cucumbers are very cold-sensitive and should not be planted until all danger of frost has passed and the soil has warmed sufficiently. Two pounds of seed are needed per acre for direct seeding. This crop requires a continuous supply of moisture during the

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growing season, with the critical time occurring at fruiting. Pickling cucumbers mature quickly and fit well into double-cropping systems.

Growing cucumbers on raised beds with black plastic and trickle irrigation increases yields and earliness. Cucumbers can be direct-seeded through the plastic or two- to three-week-old seedlings can be transplanted into holes cut in the plastic. Plasticulture cucumbers are usually grown in double rows.

Vines should be trained to run lengthwise in the row soon after vining starts. This training makes hand harvesting easier and quicker with less damage to the plants. Cucumbers can also be trellised to improve fruit quality; trellising has been most beneficial in mid-summer plantings for fall harvest.

Providing one strong hive of bees for each acre of cucumbers will help to ensure good pollination in commercial plantings.

Pest management
Cucumber beetle, the major insect problem of cucumbers in Kentucky, is also the carrier (vector) of one of the most serious cucumber diseases, bacterial wilt. The use of an imidacloprid insecticide at transplanting provides good protection for about 4 weeks and may be followed by regular foliar insecticide applications. Other troublesome pests include mites and squash vine borer. In addition to bacterial wilt, powdery mildew, downy mildew, gummy stem blight, belly rot, and viruses can result in crop losses. Multiple control strategies are needed to prevent or reduce disease losses. As with all vegetables, weeds can be a serious problem for growers. Black plastic mulch usually works well to remove weed pressure from within rows while areas between rows are typically cultivated and a pre-emergent herbicide applied shortly after planting.

Harvest and storage
Picking the first harvestable cucumbers is very important to ensure continued production. Cucumbers picked by hand should be harvested every other day for best yields and quality. Cooling soon after harvest helps maintain quality and extend shelf life. Cucumbers for fresh, wholesale market are often waxed and marketed in $1^{1}/_{9}$-bushel waxed cartons. Fruit can be held in storage for about 2 weeks at the proper temperature and relative humidity.

Pickling cucumbers are harvested when the fruit is small and immature. For best yields it is essential that plants be picked clean at each harvest, being sure to remove any overgrown fruit that was missed during previous harvests. The fewer fruits that are allowed to become full-grown, the more the vines will produce.

Labor requirements
Labor needs for irrigated cucumbers are approximately 20 hours per acre for production, plus 50 hours per acre if plants are trellised. Plasticulture will add 8 to 10 hours more per acre for the post-harvest removal and disposal of the plastic. Harvesting, washing, and packing will require about 348 hours per acre.

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.

Production costs for cucumbers grown on black plastic with trickle irrigation are estimated at $1,303 per acre, with harvest and marketing costs at $2,751 per acre. Total costs (including fixed costs) are approximately $4,500 per acre.

Production costs for irrigated late summer plantings with a single strand trellis are approximately $2,003, with harvesting and marketing costs of $3,528. Total costs are approximately $6,000.

Since returns vary depending on actual yields and market prices, the following per acre returns to land and management estimates are based on

three different scenarios. Conservative estimates represent the University of Kentucky's statewide average cost and return estimates for 2009.

SUMMER PRODUCTION

Pessimistic	*Conservative*	*Optimistic*
$(771) *	$33	$439

FALL TRELLIS PRODUCTION

Pessimistic	*Conservative*	*Optimistic*
$(701) *	$607	$961

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

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
- Vegetable and Melon Budgets (University of Kentucky, 2008) http://www.uky.edu/Ag/cdbrec/vegbudgets08.html
- Vegetable Production Guide for Commercial Growers, ID-36 (University of Kentucky) http://www.ca.uky.edu/agc/pubs/id/id36/id36.htm
- Commercial Production and Management of Squash and Cucumbers, Bulletin 1178 (University of Georgia, 2009) http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=6277
- Commercial Production of Pickling and Slicing Cucumbers in North Carolina, AG-552 (North Carolina State University) http://www.ces.ncsu.edu/depts/hort/hil/ag552.html

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Photos by Brent Rowell, University of Kentucky (cucumber field) and Rosier Lerner, Purdue University (cucumber fruit inset)

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