

# Tomato

Tomato (*Lycopersicon esculentum*) is a warm season crop that originated in South America. Tomatoes are one of the most popular and profitable crop alternatives in Kentucky. Growers able to provide the earliest locally grown tomatoes can often demand a premium price.

## Marketing

Tomatoes are grown in Kentucky primarily for fresh market sales. There has been little in-state market potential for processed tomatoes since the movement of those industries to California several years ago. However, recent developments in locally produced tomato-based products have resulted in a small regional processing market in some parts of the state.

Fresh market options include roadside stands, local wholesalers and retailers, national wholesale markets, community supported agriculture (CSA) subscriptions, cooperatives, produce auctions, local restaurants, and farmers markets. Planting for very early or for late fall markets often brings the most profit since prices tend to be higher. New producers should consider low-volume retail sales opportunities, such as farmers markets or roadside stands. Large-scale production usually requires knowledge of wholesale marketing channels that can handle larger volumes of produce.

## Market Outlook

The U.S. per capita consumption of fresh tomatoes has remained steady during the



last decade. According to University of Kentucky research, most tomato marketing channels in the state are currently underutilized.

## Production Considerations

### *Variety selection*

Cultivar selection is a critical decision for commercial tomato growers, but with thousands of varieties available it can seem a daunting task. Cultivars differ in such horticultural traits as fruit characteristics (e.g. size, color, shape, flavor, and intended use), earliness (early, mid, and late season), growth habit (determinate and indeterminate), and disease resistance. Consideration needs to be given to regional preferences, as well as whether to grow hybrids and/or heirloom cultivars. Growers should only select adapted varieties that have the qualities in demand for the intended market.

### *Site selection and planting*

Choose a site with well-drained soil that warms up quickly in the spring. Tomatoes are quite cold-sensitive, so avoid low-lying fields that are subject to

**Crop Diversification  
& Biofuel Research  
Education Center**

late frosts and high humidity. Locate tomato fields where plants will not be damaged by herbicide carryover or drift. In addition, fields should be rotated out of tomatoes and related solanaceous crops (e.g. tobacco, pepper, and potatoes) for a period of 3 years. Tomatoes do well when transplanted to a field where fescue sod was plowed under the previous fall.

Stocky, container-grown transplants are most desirable for transplanting as they will result in higher early yields than bare-root plants. Early tomatoes generally command higher prices, which usually more than offsets the higher cost of good quality container-grown plants. Many growers produce transplants in 72- or 128-cell trays, although some grow transplants for their earliest crops in larger cells. Tomatoes will tend to get “leggy” if produced in smaller cell trays where plants are tightly spaced. Transplanting is done during the latter part of April or early May for a spring crop and in mid-July for a fall crop. Most growers use approximately 4,200 to 5,000 plants per acre.

Tomato plants are pruned, staked, and trellised to obtain higher and earlier yields. Trellising not only improves fruit quality, but allows for quicker harvests and better spray penetration for pest management. University of Kentucky on-farm demonstrations have shown that the highest profits can be obtained with raised beds covered with black plastic and using drip irrigation and fertigation. The moisture levels under the plastic must be carefully monitored when using this plasticulture system so that they are relatively constant during the growing season. Allowing soils to dry and then rapidly applying large volumes of water can lead to cracking in the fruit.

#### *Pest management*

Tomatoes are subject to a large number of diseases, which includes anthracnose, bacterial canker, bacterial spot, early blight, Fusarium wilt, root knot nematode, Septoria leaf spot, southern blight, and Verticillium wilt. Resistant varieties are available for several diseases; nevertheless,

the control of foliar and stem diseases will require regular sprays of both bactericides and fungicides for most of the season. Timing of sprays and good coverage are critical to disease control. Blossom end rot is a common physiological disorder related to poor calcium uptake. While instances arise where calcium levels in the soil are deficient, blossom end rot usually results from sporadic irrigation and insufficient calcium movement into the fruit via the plant’s transpiration stream. This disorder can largely be prevented with careful water management.

Potential insect pests include aphids, cutworms, flea beetles, fruitworms, mites, and stinkbugs. Scouting to monitor populations can help the grower determine when and how often insecticides should be applied. Herbicides, plastic mulch, and a good rotation system can help manage weeds.

#### *Harvest*

Tomato fruit is easily damaged and should be handled as carefully as possible in all picking, grading, packing, and hauling operations. Fruit is harvested at the maturity stage preferred by the intended market. Vine-ripe tomatoes must be harvested as often as twice a week, whereas mature-green tomatoes are only harvested three or four times during the season. Pack tomatoes in the type and size container the market requires.

#### *Labor requirements*

Labor needs per acre are approximately 60 hours for production, 600 hours for harvest, and 100 hours for grading and packing. Plasticulture will add 10 to 18 hours more per acre, mainly for the removal and disposal of the plastic.

### **Economic Considerations**

Initial investments include land preparation, the purchase of seed or transplants, and the purchase of stakes or other training system. Additional start-up costs can include the installation of an irrigation system and black plastic mulch.

Production costs for staked, trickle irrigated tomatoes are estimated at \$2,090 per acre, with

harvest and marketing costs for 1,600 boxes at \$8,440 per acre. Total expenses are approximately \$10,815 per acre.

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. These estimates are the returns above a \$3,300 cost attributed for 220 hours of operator labor at \$15 per hour. Conservative estimates represent the University of Kentucky's average cost and return estimates in 2009.

<i>Pessimistic</i>	<i>Conservative</i>	<i>Optimistic</i>
\$(475) *	\$610	\$2,020

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

## **Selected Resources**

- IPM Scouting Guide for Common Pests of Solanaceous Crops in Kentucky, ID-172 (University of Kentucky, 2008)  
<http://www.ca.uky.edu/agc/pubs/id/id172/id172.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 Tomato Production Handbook (University of Georgia, 2010)  
[http://www.caes.uga.edu/Publications/displayHTML.cfm?pk\\_id=7470](http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=7470)
- Fresh Tomatoes Profile (Agricultural Marketing Resource Center, 2009)  
[http://www.agmrc.org/commodities\\_\\_products/vegetables/fresh\\_tomatoes\\_profile.cfm](http://www.agmrc.org/commodities__products/vegetables/fresh_tomatoes_profile.cfm)
- Organic Tomato Production (ATTRA, 1999)  
<http://www.attra.ncat.org/attra-pub/tomato.html>

---

*Reviewed by Brent Rowell, Extension Specialist (Issued 2002, Revised 2006)*

*Reviewed by Tim Coolong, Extension Specialist (Revised 2010)*

*USDA-ARS photo courtesy of Bugwood.org*

**March 2010**

---

For additional information, contact your local [County Extension](#) agent