



Heirloom Tomatoes

Matt Ernst¹

Introduction

Tomatoes (*Lycopersicon esculentum*) are the most popular of heirloom vegetables, which are vintage varieties preserved by passing seed down from generation to generation. Heirloom tomato purchases grew in popularity as consumers sought flavorful, historic varieties. Many heirloom tomato varieties have unique coloration and appearance, but poor shipping characteristics, giving heirloom tomatoes an advantage for local sales.

Marketing

Heirloom tomatoes are grown primarily for fresh market sales. Direct markets for heirloom varieties include farmers markets, roadside stands, local grocery stores and community supported agriculture (CSA) subscriptions. There are also wholesale opportunities available, especially from buyers willing to pay premium prices for locally grown tomatoes. Those may include restaurants, food co-ops, specialty grocers and some institutional foodservice.

Market Outlook

Tomatoes are one of the most popular summer vegetables for local markets and consumers remain interested in full-flavored and novel heirloom varieties. In recent years, many commercial vegetable wholesalers have added heirloom types to wholesale product lines, and this presents opportunities and challenges for farms relying on direct sales. More consumers are now familiar with heirloom types, meaning they may be more likely to make local heirloom tomato purchases. At the same time, direct farm marketers may now face competition from grocers and other higher-volume outlets offering heirloom tomato types. Heirloom tomato producers can also capitalize on foodservice trends that emphasize local



and hyper-local sourcing of fruits and vegetables.

Farms successfully marketing heirloom tomatoes usually find a mix of market outlets that matches the farm's tomato volume and quality with markets offering prices that meet farm profitability goals. Successful heirloom tomato marketers frequently maintain robust consumer education activities. These can include cooking demonstrations, local presentations about the history of tomato varieties, communication by social media, and on-farm field days designed to connect consumers with where food is grown. Organically grown heirloom tomatoes can also command premium prices; however, these premiums may vary considerably between market areas.

Heirloom vegetables are also a popular part of community supported agriculture shares and similar marketing techniques. A 2005 SARE research project found a favorable consumer response when growers provided a box of heirloom tomatoes at various maturity stages with directions on using tomatoes as they ripened.



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Production Considerations

Site selection and preparation

Choose a site for tomato production with well-drained soil that warms up quickly in the spring. Tomatoes are quite cold-sensitive, so low-lying fields that are subject to late frosts should be avoided. Locate tomato fields where plants will not be damaged by herbicide drift from neighboring fields. Fields should be rotated out of tomatoes and related solanaceous crops (e.g. tobacco, pepper and potatoes) for a period of three years to avoid disease problems common to this plant family. Tomatoes do well when transplanted to a field where fescue sod was plowed under the previous fall.

Healthy soil is key to successful tomato production. Soil fertility can be enhanced by proper amounts of fertilizers, including properly aged animal manure and green manure (cover crops turned under prior to planting). High levels of nitrogen in soils planted to tomatoes can result in excess foliage at the cost of fruit production. Tomatoes require moderate to high levels of phosphorus, potassium and calcium in balanced proportions.

Cultivar selection

Choosing an heirloom cultivar can be a challenge as there are hundreds of different heirlooms available. Tomato cultivars differ in fruit characteristics (e.g. size, color, shape, flavor and intended use), earliness (early, mid- and late-season), and disease resistance. Cultivars also differ in growth habit, classified as either determinate (bush with a limited production season) or indeterminate (vining with a longer production season). Adaptability to local conditions and suitability to intended production practices must also be considered.

Other factors that can dictate varietal selection for fresh markets are consumer demand and regional preferences. Growers should select heirloom varieties that have the qualities in demand for the intended market. For heirloom varieties, this may be complicated by consumers being unable to distinguish differences in taste between heirlooms and newer hybrids. Past University of Kentucky variety trials and taste tests of both heirloom and hybrid varieties indicated taste panelists liked flavors of both heirloom and hybrid varieties.

Planting and crop management

Transplanting is done after the last killing frost for a



'Mortgage Lifter' heirloom tomatoes

spring crop and in July for a fall crop. The earliest and latest safe planting dates for tomatoes vary according to the region of Kentucky. Most growers use approximately 4,200 to 5,000 plants per acre.

Stocky, container-grown transplants are most desirable for transplanting as they will result in higher early yields than bare-root plants. The higher prices generally commanded by early tomatoes usually more than offset 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.

Grafting tomatoes has increased in popularity, including among producers of heirloom and specialty cultivars. Grafting tomatoes can reduce susceptibility to some diseases. High tunnel production can also reduce foliar diseases, decrease cracking, improve yields and extend the season for some heirloom cultivars.

The use of mulch will help preserve soil moisture, moderate soil temperatures, and prevent weed germination near plants. In addition, mulches can reduce the incidence of soil borne diseases that occur when soil is splashed on fruit and foliage, as well as reduce fruit contact with the soil. Mulching materials include natural materials and synthetic materials, such as newspaper and plastic. The use of hay mulch has been demonstrated to provide similar yield benefits to polyethylene mulch in heirloom tomato trials at Kentucky State University.

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. Black plastic enhances earliness by warming soils in the spring. The moisture levels under the plastic must be carefully monitored with tensiometers so that moisture remains relatively constant during the growing season. Allowing soils to dry and then rapidly applying large volumes of water can result in fruit cracking; fluctuations in soil moisture can also lead to blossom end rot.

Sucker removal (pruning) should be done as needed to reduce vegetative growth and encourage fruit development. It is important to strike a good balance between fruit and foliage as excessive pruning can reduce yields and fruit quality. Supporting and training tomato plants using cages, stakes or a trellis system is advantageous. While support systems require additional material and labor, the benefits generally outweigh the costs. Support systems result in improved fruit quality, less post-harvest fruit decay, and increased yields when compared to unsupported plants lying on the ground. Support systems, along with pruning, result in improved air circulation through plants, thus fewer foliar disease problems. Additionally, supported plants are easier to harvest. The support system should be in place two to three weeks after transplanting.

Pest management

Tomatoes are subject to a large number of diseases, which include anthracnose, bacterial canker, bacterial spot, early blight, Fusarium wilt, root knot nematode, Septoria leaf spot, southern blight and Verticillium wilt. Heirloom varieties may also be susceptible to tobacco mosaic virus. While some heirloom varieties may show tolerance to disease, many of these older varieties do not have the disease resistance that has been bred into modern tomato hybrids. Control of foliar and stem diseases could require regular sprays of both bactericides and fungicides for most of the season. Timing of sprays and good coverage are critical to disease control. Growers may also want to consider wider in-row and between-row spacings for heirloom tomatoes to increase air flow and reduce disease infections. Blossom end rot is a common physiological disorder that can be prevented with careful water management.

Following good cultural practices, such as maximiz-

ing air circulation (e.g., with plant spacing, pruning and trellising), rotating crops, maintaining well-balanced fertility, managing soil moisture, and practicing sanitation can go a long way in preventing problems that would reduce yields. Frequent scouting is essential to keeping ahead of potential problems; monitoring diseases and pests requires accurate identification.

Potential insect pests include insect aphids, cutworms, flea beetles, fruitworms, mites and stinkbugs. Scouting to monitor populations can help the grower determine if 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. Many heirloom varieties are especially fragile when harvested at full maturity and may require more frequent harvests than twice-a-week used in many commercial vine-ripe tomato systems. Pack tomatoes in the type and size container the market requires. Easily damaged heirloom varieties may require special packaging if long distance deliveries are required.

Labor requirements

Labor needs per acre for conventional commercial tomatoes 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. Labor for heirloom varieties can vary substantially, depending on yield and production system. Small-scale heirloom tomato production labor requirements yielding 2,400 pounds (120 boxes) of heirloom tomatoes were estimated at 12 to 20 hours production labor and 25 to 35 hours harvest labor for eight 100-foot rows (approximately one-tenth of an acre, 2017).

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 may include the installation of an irrigation system and black plastic mulch.

For one-tenth an acre (eight 100-foot rows) of heirloom tomato production, total production costs (including

fixed costs of land) were estimated at \$1,175 for Kentucky in 2017. Assuming yields of 2,400 pounds sold at \$2 per pound, this plot would return \$1,820 to land, capital and management. That return assumes hired planting and harvest labor paid \$12.50 per hour and 50 hours of operator labor valued at \$15 per hour.

Large-scale production of heirloom tomatoes is not as common as production of hybrid varieties. For Kentucky in 2017, production costs for staked, trickle-irrigated tomatoes were estimated at \$5,800 per acre with harvest and marketing costs for 1,600 boxes at \$8,900 per acre. Total costs, including fixed costs, were estimated at approximately \$15,740 per acre. Sale of 1,600 boxes at \$14 per box would return about \$6,650 per acre to operator labor, land, capital and management. Actual returns can vary widely according to management, price and production efficiencies.

Selected Resources

- Vegetable Production Guide for Commercial Growers, ID-36 (University of Kentucky) <http://www2.ca.uky.edu/agcomm/pubs/id/id36/id36.pdf>

- “Heirloom Vegetable Production Strategies to Improve Family Farm Income” (SARE, 2005) SARE Project Report FNC05-576 <https://projects.sare.org/project-reports/fnc05-576/>
- “Implementation of Novel Grafting Methods and Rootstocks for Organic and Heirloom Tomato Growers in the Midwest.” (SARE, 2012) SARE Project Report GNC12-162 <https://projects.sare.org/project-reports/gnc12-162/>
- Training Systems and Pruning in Organic Tomato Production (eXtension, 2015) <http://articles.extension.org/pages/18647/training-systems-and-pruning-in-organic-tomato-production>
- “Heirloom Seed Saving Demonstration.” (Kentucky State University, 2009) <http://organic.kysu.edu/Heirloom.shtml>

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