Growing Heirloom Tomatoes

The tomato, Lycopersicon esculentum, is a tender, warm season crop belonging to the Solanaceae or nightshade family. It is a fruit (a berry) used as a vegetable. Although the plant is subtropical, and thus perennial in frost-free areas, it is grown as an annual in summer gardens far to the north.

An heirloom tomato is considered to be a variety that has been passed down from generation to generation because of its important characteristics. They have become very popular and available among home gardeners and organic producers. These tomatoes produce fruits that are very tasty and vary significantly in color and size. However, many varieties are not suited for exportation because of their thin skins and a shorter shelf life than other tomatoes.

Heirloom tomatoes may not be suited for all growers but there are many advantages to growing these tomatoes. They are considered to be tasty, some are meatier, some have fewer seeds, and some taste a bit salty or spicy. Conventional tomatoes have the advantage of being uniform in size with a long shelf, but are considered “bland” and lack the taste of the heirloom variety. Heirloom tomatoes also cover a wide range of colors, including stripes and blushes. This allows the customer to differentiate heirlooms from conventional red tomatoes (Brown, 2007). However, there are some disadvantages in growing heirloom tomatoes. These tomatoes, in many cases are less vigorous than the other hybrids and usually produce less fruits. They are also more susceptible to diseases such as blossom-end rot, septoria leaf blight, and early blight. They are not suited for exportation or storage because of their thin skins. They are unusual in size and color and therefore, not attractive to customers who prefer the more familiar, uniform conventional varieties (Brown, 2007).
Heirloom tomatoes consist of many cultivars and include the following:

1. **Black Prince** – This indeterminate (continues to grow indefinitely) variety is a very pleasant, reddish-brown color, the size and shape is similar to a rounded egg and it gives good yields and matures fairly early.

2. **Brandywine** - An Amish indeterminate heirloom from the late 1800s. It is considered one of the best-tasting tomatoes and is a potato-leaf variety with large fruits ripening late in the season. There are many strains and colors of Brandywine being sold.

3. **Cherokee Purple** - An indeterminate medium-sized fruit and is purple-brown in color. It is considered by many to be one of the better-tasting tomatoes. The fruit frequently shows green shoulders.

4. **Green Zebra** - The outstanding visual appeal of this tomato is a big selling point. It is an indeterminate, dark and light green striped fruit which develops a yellow blush when it is ripe. The fairly early fruit is considered to have an outstanding visual appeal, a big selling point.

5. **Stupice** - Very early potato-leaf variety, indeterminate, with good tolerance to cold, good flavor and high yields. The fruit is small - only 1 to 2 ounces. The small fruits are less in demand later in the season when they are competing with equally tasty, larger-fruited varieties (Brown, 2007).

**Propagation and Planting**

The key to success with heirlooms is choosing a variety that is well suited to your growing conditions. Because heirloom tomatoes have not been bred for generations to promote vigor and disease resistance, these varieties need a little bit of extra care (Welsford, 2008). Tomatoes prefer a well-drained, loam soil with a pH of 5.8-7.2, but they grow best in soils with a pH of 6.0 to 6.5. Special preparation such as digging or deep chisel plowing will help loosen the soil. Compost can be added to the soil to improve organic matter content. Till the soil at least eight inches deep to incorporate the soil organic matter. Soil preparation should be completed at least a month before planting. If using raised beds, get them constructed and filled. Plant seeds 6-8 weeks indoors before transplanting. Seeds should be obtained from reliable seed sources. Planting mix can be obtained from a local garden store and should contain peat moss, which has the capability to hold adequate amounts of moisture for good germination. Planting mix should then be placed in trays or individual pots. Plant seeds on the surface of trays and cover lightly with potting mix. If using individual pots, place seeds about one inch below the surface. Cover seeds with ¼ inch of starting mix and gently firm the surface. Check seed trays every two to three days to make sure they stay moist. Seeds will usually take 10-14 days to germinate (depending upon variety). Once the seeds have sprouted, they will need a light source. If starting under a grow light, make sure the grow light is within six inches of the seedlings or they will become tall and leggy. Seedlings need 12-16 hours of light a day. Seeds planted in trays will require transplanting into individual pots. Once the seedlings are showing a second set of leaves, it is time to transplant them from the starting tray to individual pots (Heirloom Tomatoes,
Gently loosen the soil in the starting tray and separate individual plants. Fill the transplant pot with moistened starter mix and place seedlings in pot, gently firming the soil around the seedling.

Prior to transplanting in the field the seedlings should go through a hardening off process. This process allows seedlings to slowly adapt to the more intense light, winds, temperature difference, and other conditions that they will endure outdoors. Hardening off requires time, but the process itself is simple ((Point, 2006). Transport seedlings carefully to a sheltered area. This initial exposure should be short, only an hour or two during the early morning or late evenings. Start slowly in the beginning and, if the plants wilt, return indoors until the next day. Start the hardening off process a couple of weeks before planting the seedlings out into the garden or field. Each day move the plants outside for increasing lengths of time, so they gradually get used to outdoor conditions (Point, 2006). The hardening off process occurs for seven to ten days.

Tomato plants should not be planted until all danger of frost has passed. Transplant fall tomatoes in the garden or field about 100 days before the first expected frost. Tomato seedlings should be transplanted in the evening or on a cloudy day to prevent plants from wilting and getting too dry. When planting seedlings, bury them in the ground two thirds of the way down or to where the stem begins to thin out. They will send out roots from the stem and begin their top growth more quickly as well as anchor them into the soil. More roots will significantly improve the plants ability to obtain water and nutrients, resulting in larger yields (Heirloom Tomatoes, 2009). Line the inside of the planting hole with compost and/or add a few tablespoons of Osmocote or a similar slow-release fertilizer. (Growing Heirloom Tomatoes, 2006). Tomato plants need to be spaced at least 2 ½ to 3 feet apart in rows at least 4 feet apart.

**Cultural Practices**

Once the tomato seedlings are planted outdoors they should be watered daily for the first week. Irrigation of plants should be done in the morning when it’s cool. Watering early in the day reduces evaporation loss and allows plant foliage to dry quickly. Wet foliage overnight may help produce some diseases. Furrow irrigation, drip irrigation, or soaker hoses deliver water right at the soil surface and not on the leaves, so you can water anytime (McLaurin, 2009). However, the drip irrigation system is more efficient and water is released slowly, in close proximity to root system. Tomatoes have been observed to take up water from depths up to 13 feet. They are heavy water users and require frequent irrigation to delay maturity and prolong production. A thorough soaking every four or five days on light, sandy soils and every seven to ten days on heavy soils is a good general guide for irrigating tomatoes in the absence of rain ((McLaurin, 2009). Irregular moisture conditions can cause radial and concentric cracking on fruit. This is a serious physiological disorder that leaves the affected tomatoes unmarketable, and it deteriorates quickly. To help preserve soil moisture, mulches can be applied. This practice reduces the variation of soil moisture, and plants have access to available moisture. Mulch should not be applied until after the transplants have been growing for five to six weeks. If mulch is applied too early, the soil will be cooler and
plant growth will be slowed. However, when the soil is warm and plants begin growing, applying mulch will keep the soil cool during the summer and will also retain moisture (McLaurin, 2009).

Tomatoes require a lot of nutrients. Phosphorous promotes fruiting and nitrogen increases vegetative growth. Fertilize regularly (every two to three weeks), but do not overdo it. Organic fertilizers are preferred because they tend to enhance heirloom tomatoes’ rich flavors. Most growers agree that the natural ingredients in organic fertilizers improve flavor more than chemical fertilizers, and flavor is considered the important and preferred attribute when growing heirlooms (Growing Heirloom Tomatoes, 2006). Pruning is important when growing heirloom tomatoes. Pruning off suckers is a trade-off between reduced overall fruit production and increased fruit size and quality. Because flavor is such an important aspect of heirlooms, pruning might be worth it, especially for very large tomatoes (Growing Heirloom Tomatoes, 2006). Staking and supporting is an important cultural practice because heirlooms can grow to over six feet tall. It is important to use good strong stakes or trellises that can hold extra weight. Most commercial cages are much too small for tomatoes although they may work well on crops such as peppers. It is recommended to have sturdy wire fencing, and anchor cages to the ground to prevent them from blowing over. To control weeds, cultivate or hoe around the plants. Work the soil only deep enough to kill the weeds. Do not disturb the tomato plant roots (Cotner, 2006).

**Pest and Diseases**

Tomatoes are affected by a large number of pests from planting at all stages of growth. Aphids, flea beetles, leaf miners, and spider mites are a problem to plant bed tomatoes. Flea beetles, aphids, leaf miners, stink bugs and fruit worms cause foliage damage in the field. But these insects can also cause serious damage to fruits and can be carriers in the spread of diseases. These pests are divided into two groups: 1) pests that feed on the upper plant and 2) pests that feed on the lower plant. Those which feed on the upper parts of the plants either mine leaves, bore into fruit and buds, chew holes in leaves or suck the sap. The fruit worm, bud worm, pinworm, and leaf miner bore into fruits, buds and mine leaves. The pests that chew holes in leaves are the blister beetle, cabbage looper, Colorado potato beetle, flea beetle, and horn worms. The green peach aphid, potato aphid, greenhouse white fly and stink bug suck the sap. Transmittance of diseases and fruit drop can also be caused by these insects.

The cutworm and the wire worm feed on the lower plant and root. The controls vary from state to state and region to region. The local agricultural chemical manual will list controls and rates for each pest.

There are many diseases that affect the tomato plant. These are caused by pests including bacteria, fungi, and many viruses.

**A. The bacterial diseases include:**

1. Bacterial wilt (Pseudomonas solanacearum) is a soil born bacterium which infects the roots and stems of the plant and causes a rapid wilting and death of the plant. The plant dies so quickly it does not have time to yellow. It also attacks peppers, potatoes
and eggplant. Carefully dig out infected plants and soil and discard. Do not plant any of these vegetables in this area for at least four years (Randy Drinkard, 2005). There are no controls or resistant varieties for bacterial wilt. Crop rotation and sanitation are used to control this disease.

2. Bacterial canker (Corynebacterium michiganense) is a seed borne bacterium in which cankers form on the stems and petioles. Symptoms begin with lower leaves turning downward. Dark to light brown streaks may develop on the midribs of the leaf and eventually extend down the petiole to form a canker on the stem. There may be discoloration in the vascular system. Symptoms on fruit are small, white, scabby, raised lesions, often described as “bird’s eye.” If identified, destroy the plants. Do not compost plant material. Do not plant tomatoes, potatoes or eggplant in the same soil for two to three years (Edmunds and Potterff, 2009).

3. Bacterial speck of tomato (Pseudomonas syringae) is a problem in moist weather. On green fruit, speck lesions are visible as small, sunken, black spots surrounded by darker green haloes. Spots are dark brown to black, superficial flecks on ripe fruit. The spots on leaves are small, black lesions surrounded by major chlorotic (yellow) haloes. Lesions in the stems are dark brown to black and shaped like elongated ovals. To control this disease destroy tomato residues and volunteer tomato plants. Pesticides applied for bacterial spot control should also provide some bacterial speck control (Pernezny and Zhang, 2008).

B. The fungal diseases include:

1. Verticillium and fusarium wilts are soilborne diseases that cause yellowing of the leaves, wilting and premature death of plants. These diseases persist in gardens where susceptible plants are grown. Once they build up, the only practical control is the use of resistant varieties (Wolford and Banks, 2010). Many of the heirloom varieties do not have resistance to verticillium wilt or fusarium wilt (Edmunds and Potterff, 2009).

2. Early and late blight (Alternaria solani and Phytophthora infestans, respectively). Early blight is characterized by dark brown to black, leathery, sunken spots and concentric rings at stem end that usually start on the lower leaves and spread up the plant. Symptoms of late blight include large, firm, greasy, rough, brown spots. Although early blight is most severe on the leaves, it sometimes occurs on the stems and can cause severe defoliation. Certain varieties (Roma and Supersonic) are more tolerant of early blight than others (Wolford and Banks, 2010). Fungicides can be used to control both blights.

Blossom-end rot is a dry, leathery brown rot of the blossom end of the fruit that is common in some seasons on tomatoes. It is caused by the combination of calcium deficiency in the developing fruit and wide fluctuations of soil moisture. The problem is especially bad in hot weather. Soil applications of calcium seldom help, though foliar calcium sprays may minimize the occurrence of the problem. Some tomato varieties are much more susceptible
to this condition than others. Mulching and uniform watering help to prevent blossom-end rot. Once the blackened ends appear, affected fruits cannot be saved. Remove and destroy so that healthy fruit setting later can develop more quickly (Wolford and Banks, 2010).

Other common problems of tomato include: a) leaf rolling which occurs when the plant has set a heavy load of fruit and the light intensity is high. It can be caused by wet soils. Prune less heavily and plant in a well-drained area, b) Fruit cracking is due to rapid growth after periods of slow growth. Rain after drought and heavy fertilization can cause fruit cracking. Harvest fruits after they begin to turn red but before they crack. Follow the watering practices and look for cracking resistant varieties, c) Catfacing is caused by cool temperatures at time of pollination. The fruit is deformed with zippers on the skin. The fruit can have lobes, tear drops or several blossom scars. Plant resistant varieties, plant later, or use row covers to increase the temperature on cool days and nights. The fruit is still edible, and d) Sun scald appears as a white blistered area on the top of the tomato. Do not prune heavily, and maintain nutrition and pest control to provide a good leafy cover for the fruits (Randy Drinkard, 2005).

**Harvesting**

Depending on the variety and the growing season, heirloom tomatoes will be ready for harvest from 65 to 95 days after transplanting. Wait until a tomato is ripe before harvesting it, but that point may not be as obvious with some heirloom varieties as with most hybrids. Pick the fruit when the bottom is thoroughly ripe. Don’t be put off by lumpiness or “cat-facing” (scarring) of ripe fruits, either (Reich, 2009). They can also be picked just before they become fully-ripe and vulnerable to injury and pests.

**REFERENCES**


McLaurin, W.J. 2009. Environmental effects on tomatoes. College of Agriculture and Environmental Sciences, University of Georgia.
http://interests.caes.uga.edu/drought/articles/tomato.htm


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