The

Connecticut

Agricultural

Experiment

Station,

New Haven

CAES

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

Bulletin 1080

August 2021

Heirloom Tomato Trials 2018-2020

Abigail A. Maynard, Ph.D.
Department of Forestry and Horticulture

Heirloom Tomato Trials 2018-2020

Abigail A. Maynard, Ph.D.
Department of Forestry and Horticulture

ABSTRACT

In 2018-2020, thirty-one varieties of heirloom tomatoes were grown on a sandy terrace soil (Windsor, CT) and a loamy upland soil (Hamden, CT). Yields were determined weekly from late July until frost in October. The average total estimated yield for 31 varieties in 2018-2020 was 57.4 T/A at Windsor compared to 46.9 T/A at Hamden with yields at Windsor greater than those from Hamden in 2 out of the 3 years. Higher yields were due mostly to a greater average number of tomatoes per plant. Even though different varieties were grown, the average total yields at Hamden were more consistent from year to year with a 14% difference between the highest and lowest yields compared to a 73% difference at Windsor. Varieties with the greatest yields were Artisan Orange Jazz, Granny Cantrell, Kanner Hoell, Mrs. Maxwell's Big Italian, Striped German, and Trucker's Favorite. Mrs. Maxwell's Big Italian produced the heaviest tomatoes (16.0 oz). The variety producing the greatest number/plant was Slava (167.1 tomatoes/plant). For a few varieties, we observed radial concentric cracking and catfacing, but overall fruit quality was very good to excellent. Varieties with the highest consistent quality were Amish Gold Slicer, Brandywine Orange, Fireworks, Golden Jubilee, Old Brooks, and Trophy. Varieties producing poor quality fruit were Vintage Wine and Wild Boar Pineapple. These varieties were also especially prone to cracking as were Marianna's Peace and Redfield Beauty. Characteristics of each variety including timing of harvest are discussed along with management techniques.

INTRODUCTION

Agriculture in Connecticut has seen vast changes in the past three decades. Tobacco and dairy farming, once the largest agricultural industries, have diversified with a shift to increased vegetable, nursery stock, and Christmas tree production. New farming ventures on idle and rented land have increased the number of farms (annual income exceeding $1,000) from 3900 in 2000 to 5200 in 2019 (Anon. 2019). The number of vegetable farms increased from 579 in 1992 to 973 in 2019 (Anon. 2019). Today, over 9,000 acres in Connecticut are devoted to vegetable production. In 2007, the cash value of all vegetable crops grown in Connecticut was 30.2 million dollars or 5.5% of all crops grown (Anon. 2007). This compares to 16.2 million dollars in 1999. In 2019, tomatoes were the most popular vegetable crop grown in Connecticut with 498 farms (86% of all farms) growing the fruit (Anon. 2019). Only sweet corn and pumpkins exceeded tomatoes in acres harvested.

The marketing of produce has also shifted from wholesale contracts with local supermarkets to direct retail sales. According to the Connecticut Agricultural Marketing Directory (Anon 2009), approximately 560 farms offer a variety of fruit, vegetables, bedding plants, and Christmas trees at roadside stands and sales rooms. About 36 are open all year. Nearly 30% of vegetable farms offer pick-your-own fruit and vegetables to reduce the cost of harvest labor. The development of a network of farmers' markets in Connecticut's major urban centers and densely populated suburbs is an important segment of direct sales of vegetables to consumers. Farm fresh produce is offered at reasonable prices to urbanites who cannot travel to the farms. All produce sold at farmers' markets must be "Connecticut Grown". In 2019, there were 121 farmers' markets attended by over 400 farmers compared to 87 markets in 2007, a 28% increase.

As the popularity of farmers' markets in Connecticut have surged, so too has the need for growers to diversify with high value niche crops which are valued by diverse ethnic groups. Because of the demand of a diversity of ethnic and specialty crops, the Connecticut Agricultural Experiment Station has been investigating specialty crops since 1982 to provide new opportunities for Connecticut farmers. Over 40 fruits and vegetables have been studied including globe artichoke, Belgian endive, radicchio, jilo, specialty melons, sweet potatoes, okra, and tomatillos. Research included variety trials and experiments to determine the best cultural methods for growing the crop in Connecticut. Crops that were chosen have a high market value and an existing or expanding market that would readily accommodate these commodities.

Tomato varieties produced by the commercial tomato industry are designed to withstand the considerable physical stresses imposed by the industry's picking, packing, and shipping techniques. Hybridized plants are selected to produce uniform, attractive, even-ripening fruit that is easier to store and ship. Less emphasis is given to flavor. Seed from the fruit of these hybridized plants will not produce the same characteristics due to cross-pollination with similar plants. Hybrids are patented and require annual re-breeding under controlled conditions to reproduce the desired characteristics.

Heirloom tomatoes, on the other hand, are open pollinated. They have adapted to the natural environment so that they will continue to produce seeds that grow true despite pollination from other plants. What is an heirloom tomato? According to Taylor's Guide to Heirloom Vegetables (Watson 1996), a tomato must meet three criteria to be considered an heirloom variety: (1) the variety must grow "true to type" from seed saved from each fruit; (2) the seed must have been available for more than 50 years; (3) the tomato variety must have a unique history or folklore of its own.

A strong market for heirloom tomatoes has developed because home gardeners and consumers seek tomatoes with excellent flavor in a variety of colors, shapes, and sizes. The specialty and heirloom tomato industry is looking for producers to fill this niche market. While some specialty varieties of tomatoes (beefsteak, roma, grape) are fairly new to the market, many heirloom varieties have regained their initial appeal. Consumers perceive that heirlooms taste better and have thinner skins than hybridized tomatoes. There is a nostalgic attraction for the 'ole time' varieties that Grandma used to grow. Heirloom varieties come in many interesting colors and shapes and have unique names that make them stand out from standard hybrid tomatoes.

While heirloom tomatoes provide an excellent opportunity for local growers, they have several production problems compared to standard hybrid tomatoes. Most heirloom tomatoes have little disease resistance. Organic production, in particular, may be difficult in a wet season, because plants may become diseased before they yield much fruit. They can also be prone to catfacing, a physiological disorder that occurs

during flowering and fruit set, which blemishes and distorts the fruit. Because their skin is tender, heirloom varieties may crack easily. This makes them difficult to pack and ship long distances. Thin skins, however, are less important for home gardeners and growers who sell their fruit at local farm stands or farmers' markets. In addition to direct market sales, connections to chefs in upscale local restaurants provide valuable outlets for an unusual and beautiful crop.

Fifty-seven heirloom tomato varieties were evaluated from 2004-2009 and were described in Bulletins B1008 (Maynard 2007) and B1029 (Maynard 2010). In this bulletin, I report yield and quality of 31 additional heirloom tomato varieties grown from 2018-2020 at our experimental farms in Windsor and Hamden. Characteristics of each variety are discussed as well as management and cultural techniques. With the addition of these trials, a total of 88 of heirloom tomato varieties have been evaluated at the Experiment Station.

METHODS AND MATERIALS

Sites and soils: Trials of heirloom tomatoes were conducted over three years at the Valley Laboratory in Windsor on Merrimac sandy loam (Entic Haplorthod), a sandy terrace soil with somewhat limited moisture holding capacity (Shearin and Hill, 1962); and at Lockwood Farm in Hamden on Cheshire fine sandy loam (Typic Dystrochrept), a loamy upland soil with moderate moisture holding capacity (Reynolds, 1979).

Cultivars: Seeds were obtained from Totally Tomatoes, Randolph, WI. The cultivars evaluated in 2018 were Brandywine Yellow, Carbon, Dester, Fireworks, Granny Cantrell, Golden Jubilee, Mrs. Maxwell's Big Italian, Mule Team, Paul Robeson, and Wild Boar Pineapple Pig. In 2019 the cultivars were Brandywine Orange, German Head, Giant Oxheart, Kanner Hoell, Missouri Pink Love Apple, Mr. Stripey, Mushroom Basket, Orange Oxheart, Striped German, and Vintage Wine. The cultivars evaluated in 2020 were Amish Gold Slicer, Artisan Orange Jazz, Bonny Best, Brandywine Pink, Cherokee Purple, Marianna's Peace, Redfield Beauty, Slava, Trophy, and Trucker's Favorite. Characteristics of each cultivar are shown in Table 1. Folklore and history of some of the cultivars are shown in Table 2.

Culture: Each year, 10-11 heirloom tomato varieties were seeded in the greenhouse on April 12-13. The seedlings were grown in Promix BX (Premier, Red Hill, PA) in standard plastic pots (3601 insert) measuring 2 5/8 X 2 ¼ X 2 5/8 inches (volume 15.5 $inch^3$) and placed in a greenhouse maintained at 75-90°F. After germination, plants were thinned to one per cell. The seedlings were fertilized with water soluble 20-20-20 (N-P_2O_5-K_20) (0.5 oz/gal) four weeks after germination. After hardening the plants in the cold frame, they were transplanted between May 29 and June 2. Before transplanting, rows 4 ft apart were covered with black plastic mulch (3 ft wide) applied by a tractor-pulled plastic-layer. Transplants were planted 3 feet apart (3630 plants/acre) in holes 8 inches in diameter punctured in the black plastic mulch by a trowel. Drip irrigation tubing was laid as the plastic was applied. At each site, there were 15 plants per cultivar, with three replications of five plants per cultivar arranged randomly throughout the plot. The plants were staked and vegetative suckers removed up to the first flower cluster. Different experimental fields at both locations were used each year to minimize potential disease build-up.

Fertilization: The field soils (pH 6.5) were fertilized at a rate of 1300 lbs/A 10-10-10 (10N-4.4P-8.3K) just before transplanting.

Weed control: Weeds around the base of the plants were controlled by hand weeding. Weeds in the aisles were mechanically controlled by rototilling.

Irrigation: Water was supplied by drip irrigation at both sites. Plots were irrigated at both sites to ensure that plants received at least 1 inch of water per week either through rainfall or irrigation.

Harvest: Marketable tomatoes (at least 2" in diameter and some red showing) were harvested weekly from late July to frost (October). The harvest from each plot (5 plants) were counted and weighed in the field.

Insect and disease control: Insects and diseases were controlled by Manzate (mancozeb), Quadris (azostobin), Asana (esferivaterate), and Bravo (chlorothalmil) applied as needed throughout the growing season.

RESULTS

In 2018, the average yield of 10 cultivars of heirloom tomatoes was 37.5 lbs/plant at Windsor compared to 23.8 lbs/plants at Hamden, a 58% difference (Tables 3 and 4). In 2019, the average yield was 35.7 lbs/plant at Windsor and 27.1 lbs/plant at Hamden, a 32% difference. In 2020, the average yield was 26.6 lbs/plant at Hamden compared to 21.7 lbs/plant at Windsor, a 23% difference. The total estimated yield in 2018-2019 was 15.6 to 24.7 T/A greater at Windsor compared to Hamden. In 2020, the total estimated yield in 2020 was 8.8 T/A greater in Hamden compared in Windsor. In all years, greater estimated yield of heirloom tomatoes was mostly due to greater average number of fruit/plant. The average wt/fruit when comparing the two sites was, in 2018 and 2020, within 0.5 oz of each other while, in 2019, the wt/fruit in Hamden averaged 1.2 oz greater than Windsor. However, the number of fruit per plant in Windsor averaged 18.8 more fruit compared to Hamden which brought the overall yield up.

In 2018, at Windsor, Granny Cantrell had the greatest yields (50.5 lbs/plant), at least 13% greater than Mrs. Maxwell's Big Italian (44.8 lbs/plant), Mule Team (42.4 lbs/plant), and Dester (41.0 lbs/plant), cultivars with the next greatest yields (Table 3). Wild Boar Pineapple (30.1 lbs/plant) averaged the lowest yields. Results at Hamden were similar with Granny Cantrell averaging the greatest yields (31.1 lbs/plant) with Mrs. Maxwell's Big Italian (25.9 lbs/plant), Fireworks (25.5 lbs/plant), Dester (25.3 lbs/plant), and Mule Team (25.3 lbs/plant) with the next greatest yields (Table 4). Granny Cantrell's yields were at least 22% greater than the other cultivars. Carbon (17.1 lbs/plant) averaged the lowest yields. At Windsor, the heaviest fruit was produced by Mrs. Maxwell's Big Italian (16.0 oz/fruit), followed by Dester (14.7 oz/fruit), Mule Team (14.6 oz/fruit), and Granny Cantrell (14.5 oz/fruit). At Hamden, Mule Team (14.3 oz/fruit) produced the heaviest fruit followed by Mrs. Maxwell's Big Italian (13.9 oz/fruit), Dester (13.7 oz/fruit), and Fireworks (13.7 oz/fruit). At both sites, high yields of Granny Cantrell were obtained by relatively high number of fruits per plant (second highest of all cultivars at both sites) combined with relatively heavy fruit. Paul Robeson and Golden Jubilee had large number of fruits per plant but averaged the smallest fruit. At both sites, Granny Cantrell, Golden Jubilee, Fireworks, Mrs. Maxwell's Big Italian, and Mule Team had the best quality fruit with little cracking. Fireworks and Golden Jubilee were the easiest to pick. Wild Boar Pineapple was very susceptible to cracking and had the worse quality. It was also difficult to pick.

In 2019, at Windsor, Kanner Hoell had the greatest yields (43.8 lbs/plant), at least 11% greater than Giant Oxheart (39.5 lbs/plant), German Head (38.6 lbs/plant), Brandywine Orange (37.8 lbs/plant), Orange Oxheart (37.4 lbs/plant), cultivars with the next greatest yields (Table 3). Vintage Wine (28.4 lbs/plant) averaged the lowest yields. Striped German had the greatest yields at Hamden (33.5 lbs/plant) with Orange Oxheart (30.3 lbs/plant), Mushroom Basket (28.4 lbs/plant), Giant Oxheart (27.9 lbs/plant) and Kanner Hoell (27.9 lbs/plant) with the next greatest yields (Table 4). Missouri Pink Love Apple (23.1 lbs/plant) and Vintage Wine (23.3 lbs/plant) averaged the lowest yields. At Windsor, the heaviest fruit was produced by Striped German (15.3 oz/fruit), followed by Kanner Hoell (12.6 oz/fruit), Brandywine Orange (11.8 oz/fruit), and Orange Oxheart (11.7 oz/fruit). At Hamden, Striped German (15.8 oz/fruit) also produced the heaviest fruit followed by Orange Oxheart (14.4 oz/fruit), Brandywine Orange (13.3 oz/fruit), and Mushroom Basket (13.2 oz/fruit). At both sites, high yields were attributed mostly to heavy fruit and to a lesser extent large numbers of fruit per plant. Mr. Stripey produced the most fruit per plant at both sites but averaged the smallest fruit. At both sites, Brandywine Orange, Giant Oxheart, Mushroom Basket, and Orange Oxheart had the best quality fruit with little cracking. Vintage Wine was very susceptible to cracking and had the worse quality.

In 2020, at Windsor, Artisan Orange Jazz had the greatest yields (26.4 lbs/plant), followed closely by Trophy (25.1 lbs/plant), and Marianna's Peace (24.6 lbs/plant), cultivars with the next greatest yields (Table 3). Amish Gold Slicer had the lowest yields. At Hamden, Truckers Favorite (31.5 lbs/plant) and Artisan Orange Jazz (30.6 lbs/plant) averaged the greatest yields with Brandywine Pink (27.7 lbs/plant), Marianna's Peace (27.1 lbs/plant), Bonny Best (26.9 lbs/plant), Trophy (26.3 lbs/plant), and Slava (26.1 lbs/plant) with the next greatest yields (Table 4). Redfield Beauty (24.0 lbs/plant), Amish Gold Slicer (24.2 lbs/plant), and Old Brooks (24.8 lbs/plant) averaged the lowest yields. At Windsor, the heaviest fruit was produced by Artisan Orange Jazz (14.8 oz/fruit), followed by Marianna's Peace (13.1 oz/fruit), and Brandywine Pink (12.7 oz/fruit). All other cultivars averaged less than 10 oz/fruit. At Hamden, Artisan Orange Jazz (14.2 oz/fruit)

produced the heaviest fruit followed by Brandywine Pink (12.9 oz/fruit), Marianna's Peace (12.1 oz/fruit), and Cherokee Purple (10.5 oz/fruit). All other cultivars averaged less than 8 oz/fruit. High yields of Artisan Orange Jazz were obtained by the heaviest fruit at both sites. Slava had the greatest number of fruits per plant at both sites but averaged the smallest fruit. At both sites, Amish Gold Slicer, Old Brooks, and Trophy had consistently the best quality fruit with little cracking. Marianna's Peace and Redfield Beauty were very susceptible to cracking. Marianna's Peace was also difficult to pick as was Artisan Orange Jazz.

TIMING OF HARVEST

Table 5 shows the percent distribution of the 2018 harvest for each cultivar at each site of the three time periods throughout the growing season: beginning of harvest to August 15 (early), August 16 to September 15 (mid), September 16 to frost (late). At Hamden, most of the cultivars produced over half of their total yield between August 15 and September 15 (mid varieties). The only exceptions were Fireworks and Carbon, both of which produced more tomatoes before August 15 compared to the other cultivars. Fireworks produced half of the total yield after September 15, behaving like a late variety. At Windsor, Fireworks behaved like an early to mid variety with 80% of the total yield harvested by September 15. Except for Fireworks, cultivars at Windsor compared to Hamden produced a higher percentage of the total yield before August 15 and after September 15. Thus, yields at Windsor were spread more evenly over the growing season compared to Hamden where the bulk of the yields came between August 15 and September 15.

Table 6 shows the percent distribution of the 2019 harvest for each cultivar at each site of the three time periods throughout the growing season: beginning of harvest to August 15 (early), August 16 to September 15 (mid), September 16 to frost (late). At Hamden, all of the cultivars produced at least 48% of their total yield between August 15 and September 15 with an average of 56%. One third of the total crop (33 %) was picked after September 15. At Windsor, yields of all cultivars after September 15 were equal or greater than yields between August 15 and September 15 with an average of 44% of the crop picked after September 15 compared to 36% between August 15 and September 15. Twenty percent of the total crop was picked before August 15 at Windsor compared to 11% for the same time period at Hamden. Thus, yields at Windsor were spread more evenly over the growing season compared to Hamden where the bulk of the yields came between August 15 and September 15. Giant Oxheart was a consistent early yielder producing at least a quarter of its total yield before August 15 at both sites and Mr. Stripey and Orange Oxheart produce consistently in the mid to late time periods.

Table 7 shows the percent distribution of the 2020 harvest for each cultivar at each site of the three time periods throughout the growing season: beginning of harvest to August 15 (early), August 16 to September 15 (mid), September 16 to frost (late). At Hamden, most of the cultivars produced at least 48% of their total yield between August 15 and September 15 with an average of 52%. One third of the total crop (34 %) was picked after September 15 and 14% ripened before August 15. At Windsor, 27% of the total yield was harvested before August 15 with Slava producing 43% of the total yield before August 15. Similar to Hamden, 34% of the total yields was picked after September 15 but only 39% ripened between August 15 and September 15. Again, similar to other years, yields at Windsor were spread more evenly over the growing season compared to Hamden where the bulk of the yields came between August 15 and September 15. Artisan Orange Jazz and Brandywine Pink varieties had a fairly even distribution of fruit maturation throughout the season at Windsor, averaging less than 6 percent difference between the three periods. Slava, Cherokee Purple, and Brandywine Pink were consistent early yielders at both sites while Marianna's Peace was a high yielder later in the season.

MANAGEMENT STRATEGIES

Selection of cultivars: Many heirloom tomato varieties can be grown successfully in Connecticut. All 31 varieties evaluated produced marketable tomatoes. There are four fruit characteristics to consider when choosing a variety. First is the color of the fruit. Colors in these trials ranged from yellow to orange to pink to red to dark red. Color, a cosmetic characteristic, has little effect on taste. Size is another factor to consider. The size of the varieties in these trials ranged from small to medium to large to beefsteak. Timing of harvest is an important consideration. A planting strategy using varieties with differing maturities creates a constant supply of tomatoes throughout the harvest season. Consistent quality is important for commercial enterprises as is the total yield of fruit. Varieties with large consistent

yields at both sites with varying soils and climate should do well in most of Connecticut.

Taking all of these factors into consideration, these appear to be good choices.

Early
Slava – red, small
Fireworks – red, large
Carbon – blackish red, large
Paul Robeson – blackish red, medium
Giant Oxheart – red, medium

Mid
Granny Cantrell – red, very large
Mrs. Maxwell's Big Italian – dark pink, very large
Mule Team – red, very large
Trucker's Favorite – deep pink, medium
Artisan Orange Jazz – yellow, very large
Brandywine Pink – pinkish red, very large
Trophy – red, medium
Golden Jubilee – yellow, medium
Amish Gold Slicer – reddish orange, medium

Late
Old Brooks – red, medium
Brandywine Orange – orange-red, very large
Mushroom Basket – pink, large-very large

Planting times. In these trials, seeds were sown in the greenhouse on April 12-13 and, after germination, thinned to one plant/cell. After hardening the plants in the cold frame, they were transplanted between May 29 and June 2, when the seedlings were about 6-weeks old. At this stage, the seedlings were large enough for transplanting, but not leggy or root bound. There was no growth interruption. Many backyard gardeners, anxious to start the gardening season, start their transplants in late February or early March. At transplant time, seedlings are often root bound and their growth has slowed or stopped. Flowers may form if the plant is stressed, diverting some energy into fruit production rather than vegetative growth. Transplanting in the third or fourth week of May is ideal for Connecticut because the soil has warmed sufficiently and the threat of frost is gone.

Soil Amendments. Even though no compost was not utilized in these trials, other studies have shown that compost amendments improve tomato growth and yields. Maynard (2000) showed that, 1-inch of leaf compost applied to both loamy and sandy soils could be substituted for inorganic 10-10-10 fertilizer with equivalent tomato yields expected in the first year. Plots amended with compost appeared to have less blossom-end rot in years when this disorder was prevalent. For the greatest yields, it appeared that a combination of compost and 10-10-10 is optimum, but the full rate (1300 lb/A) was not usually necessary. A lower fertilizer rate (650 lb/A) plus one-inch compost was sufficicient for optimum yields on loamy soils and for most years on sandy soils. Compost increased the organic matter content of the soil and increased its water holding capacity.

Soils in these trials were amended with black plastic mulch. In experiments with different mulches, Hill et al (1982) found that there was an average soil temperature increase of 6 ^{o}F using black plastic mulch compared to bare soil. Heat loving crops such as tomato and eggplant produced increased yields from plots amended with plastic mulch compared to yields from the unamended controls. Decreased yields were observed on plots amended with organic mulches which cooled the soil. One detriment of plastic mulch is insufficient soil moisture because the impermeable plastic often limits resupply by rain or irrigation. Utilizing drip irrigation in these trials kept soil moisture at optimum levels. Plasticulture has the additional benefits of improved weed control and increased nutrient and water efficiency.

Pruning and staking. All plants were pruned to two main stems. The first sucker beneath the first flower cluster was saved and every sucker below it was removed. Lower suckers are less productive and more prone to soil borne diseases. The plants were tied to metal stakes weekly as they grew. Staked tomatoes control many foliar diseases by promoting air circulation. Staking separates most of the plant away from the soil where many diseases originate. Most indeterminate varieties reached the top of the 6-foot stakes midway through the growing season and were allowed to cascade toward the base.

Harvesting. Harvest began with the first ripe tomato on August 1, 2018, August 6, 2019, and July 15, 2020. Fruits were then harvested weekly until frost. Harvesting heirloom tomatoes 2-3 times a week would be optimum. One of the factors that makes heirloom tomatoes so desirable is the tenderness of the skin. This tenderness also makes many heirlooms vulnerable to cracking. Cracking can be avoided by providing even moisture. Since the skins lose elasticity as fruits approach maturity, a heavy rain (or prolonged irrigation) will swell the fruits rapidly and cause cracking. If heavy rain is predicted, it would be desirable to pick ripe and

almost ripe fruits to prevent cracking of heirloom tomatoes. Varieties in these trials particularly susceptible to cracking were Marianna's Peace Redfield Beauty, and Wild Boar Pineapple Pig. Varieties which appeared resistant to cracking compared to the other varieties were Amish Gold Slicer, Fireworks, Giant Oxheart, Mule Team, Mushroom Basket, Old Brooks, Orange Oxheart, and Trophy.

Disease Control. Plants in these trials were sprayed proactively for Early Blight, Late Blight, and Septoria or before symptoms appeared. Heirlooms have little or no disease resistance so, once disease symptoms occur, they can spread rapidly through the field. Home gardeners can slow down the spread of disease by removing diseased leaves from the plant and discarding them. In addition, once harvesting has begun, all lower leaves can be removed. Many diseases are soil borne and removing the lower leaves eliminates any possibility of transmission of diseases by rain splash.

SUMMARY

Heirloom tomatoes can be grown successfully in Connecticut with a few changes to hybrid tomato culture. Overall fruit quality was very good to excellent. However, some varieties were prone to radial and concentric cracking as well as some catfacing which detracted from their marketability. Special attention should be made to their thin skins and disease susceptibility which may require more frequent harvesting and disease surveillance. All varieties continued to produce fruit and vegetation until a killing frost in October. For the backyard gardener, heirloom tomatoes provide a flavorful alternative to standard garden tomatoes. For the commercial grower, heirlooms offer special market opportunities.

REFERENCES

Anon. 2007. 2006 Cash receipts. New England Agricultural Statistics. Sept. 6, 2006. 9p.

Anon. 2009. Connecticut Agricultural Marketing Directory. Conn. Dept. Agr. Hartford, CT 52p.

Anon. 2019. Connecticut State Agriculture Overview – 2019. United States Department of Agriculture, National Agricultural Statistics Service.

Hill. D. E., L. Hankin, and G. R. Stephens. 1982. Mulches: Their effect on fruit set, timing, and yields of vegetables. Connecticut Agricultural Experiment Station Bulletin 805. 15p.

Maynard, A. A. 2000. Applying leaf compost to reduce fertilizer use in tomato production. Compost Science & Utilization 8(3):203-209.

Maynard, A. A. 2007. Heirloom tomato trials 2004-2006. Connecticut Agricultural Experiment Station Bulletin 1008. 12p.

Maynard, A. A. 2010. Heirloom tomato trials 2007-2009. Connecticut Agricultural Experiment Station Bulletin 1029. 13p.

Reynolds, C. A. 1979. Soil Survey of New Haven County, Connecticut. United States Department of Agriculture. Soil Conservation Service. 197p.

Shearin, A. E. and D. E. Hill.1962. Soil Survey of Hartford County, Connecticut. United States Department of Agriculture, Soil Conservation Service. 126p.

Watson, B. A. 1996. Taylor's Guide to Heirloom Vegetables, Houghton Mifflin, New York. 332p.

Table 1. Fruit characteristics of tomato cultivars in 2018-2020 heirloom tomato trials

Cultivar	Color	Size*	Comments
Amish Gold	red-orange	medium	excellent quality, no cracking, blemish free
Artisan Orange Jazz	yellow	very large	high, consistent yield, outstanding flavor
Bonny Best	red	medium	good yield, solid, meaty, old time favorite
Brandywine Orange	orange	very large	good yield, great flavor, little cracking
Brandywine Pink	pink-red	very large	great flavor, hard to pick, consistent yield
Brandywine Yellow	yellow	very large	meaty, great flavor, potato leaved
Carbon	black-red	large	taste tester winner, early yield
Cherokee Purple	pink-purple	large	reliable, early, round, disease tolerant
Dester	reddish-pink	very large	slicer, taste tester winner, sweet flavor
Fireworks	red	large	early yield, easy to pick, little cracking
German Head	dark pink	large	old-time favorite, high yield, good flavor
Giant Oxheart	red	large	heart-shaped, meaty, little cracking, early
Golden Jubilee	yellow	medium-large	mild flavor, little cracking, easy to pick
Granny Cantrell	red	very large	high yield, taste test winner, little cracking
Kanner Hoell	red	very large	low acidity, moderately sweet, high yield
Marianna's Peace	pinkish-red	very large	susceptible to cracking, hard to pick, late
Missouri Pink Love	pinkish-red	large	meaty, slightly sweet, potato leaved
Mrs. Maxwells Italian	pinkish-red	very large	potato-leaved, little cracking
Mr. Stripey	red/yellow	medium	many fruit per plant, mid to late yield
Mule Team	red	very large	little cracking, round, meaty, sweet flavor
Mushroom Basket	pink	large	pleated, few seeds, sweet flavor
Old Brooks	red	medium	good quality, disease tolerant
Orange Oxheart	yellow	very large	heart-shaped, meaty, little cracking
Paul Robeson	black-red	large	best test, large number of fruits/plant
Redfield Beauty	pink	medium	susceptible to cracking, hard to pick
Slava	red	small	early yield, large number fruits/plant
Striped German	yellow/red	very large	high yield, meaty, slightly ribbed
Trophy	red	medium	little cracking, high yield, sweet
Trucker's Favorite	pink-red	medium	high yield, smooth-skinned
Vintage Wine	striped	large	susceptible to cracking, poor quality
Wild Boar Pineapple	yellow	very large	susceptible to cracking, hard to pick

*Small < 3 ounces, Medium 3-8 ounces, Large 8-12 ounces, Very large > 12 ounces

Table 2. Folklore and history of some of the varieties

Granny Cantrell – Original seeds were given to Lettie Cantrell from a World War II soldier returning home from Germany

Kanner Hoell – Donated by Reverend C. Frank Morrow of Minnesota who claims the seed originated in Germany and has been in the family since the early 1900's.

Missouri Pink Love Apple – Grown since the Civil War by Grampa Barnes, who grew it as an ornamental, believing (as many did at the time) that tomatoes or "love apples" were poisonous.

Mrs. Maxwell's Big Italian – Given seed by a friend from Italy, Mrs. Maxwell grew and saved them year after year, selecting the largest, earliest, and most crack resistant.

Paul Robeson – A Russian heirloom named in honor of Paul Robeson, the famous opera singer and civil rights activist.

Redfield Beauty – Heirloom selected from Livingston's Beauty in the late 1800's.

Slava – Name means Glory. Originally from the Czech Republic.

Trophy – Originally introduced in 1870 by Colonel George Waring, Jr. of Newport, R.I. who sold packets of seed for $5 each. A reward of $100 for the largest tomato sent many clamoring to purchase the seed.

Table 3. Yield of marketable fruit in Windsor, 2018-2020

Cultivar	Avg fruit/plant #	Avg wt/fruit oz	Avg wt/plant lb	Total est. yield* T/A
2018				
Brandywine Yellow	40.2	14.0	35.2	63.9
Carbon	45.6	12.6	35.9	65.2
Dester	44.6	14.7	41.0	74.4
Fireworks	52.1	8.2	26.7	48.5
Golden Jubilee	75.0	6.9	32.3	58.6
Granny Cantrell	55.7	14.5	50.5	91.7
Mrs. Maxwell's Big Italian	44.8	16.0	44.8	81.3
Mule Team	46.5	14.6	42.4	77.0
Paul Robeson	61.8	9.3	35.9	65.2
Wild Boar Pineapple	34.9	13.8	30.1	54.6
2019				
Brandywine Orange	51.3	11.8	37.8	68.6
German Head	61.7	10.0	38.6	70.1
Giant Oxheart	73.4	8.6	39.5	71.7
Kanner Hoell	55.6	12.6	43.8	79.5
Missouri Pink Love Apple	55.7	9.4	32.7	59.4
Mr. Stripey	81.4	6.0	30.5	55.4
Mushroom Basket	50.5	10.5	33.1	60.1
Orange Oxheart	51.2	11.7	37.4	67.9
Striped German	36.7	15.3	35.1	63.7
Vintage Wine	57.6	7.9	28.4	51.5
2020				
Amish Gold Slicer	36.5	6.9	15.7	28.5
Artisan Orange Jazz	28.5	14.8	26.4	47.9
Bonny Best	81.7	4.3	22.0	39.9
Brandywine Pink	25.4	12.7	20.2	36.7
Cherokee Purple	35.9	9.3	20.9	37.9
Marianna's Peace	30.1	13.1	24.6	44.6
Old Brooks	49.3	6.4	19.7	35.8
Redfield Beauty	55.9	5.5	19.2	34.8
Slava	118.2	3.0	22.2	40.3
Trophy	61.9	6.5	25.1	45.6
Trucker's Favorite	60.9	5.9	22.5	40.8

*Total estimated yield = Average lbs/plant for 3630 plants/A (spacing 3' x 4')

Table 4. Yields of marketable fruit at Hamden, 2018-2020

Cultivar	Avg fruit/plant #	Avg wt/fruit oz	Avg wt/plant lb	Total est. yield* T/A
2018				
Brandywine Yellow	28.5	12.6	22.4	40.7
Carbon	25.6	10.7	17.1	31.0
Dester	29.5	13.7	25.3	45.9
Fireworks	29.8	13.7	25.5	46.3
Golden Jubilee	37.0	9.4	21.7	39.4
Granny Cantrell	39.8	12.5	31.1	56.4
Mrs. Maxwell's Big Italian	29.8	13.9	25.9	47.0
Mule Team	28.3	14.3	25.3	45.9
Paul Robeson	43.5	8.4	22.8	41.4
Wild Boar Pineapple	28.6	11.8	21.1	38.3
2019				
Brandywine Orange	31.1	13.3	25.9	47.0
German Head	36.1	11.3	25.5	46.3
Giant Oxheart	51.4	8.7	27.9	50.6
Kanner Hoell	40.2	11.1	27.9	50.6
Missouri Pink Love Apple	31.3	11.8	23.1	41.9
Mr. Stripey	55.9	7.2	25.2	45.7
Mushroom Basket	34.4	13.2	28.4	51.5
Orange Oxheart	33.7	14.4	30.3	55.0
Striped German	33.9	15.8	33.5	60.8
Vintage Wine	39.2	9.5	23.3	42.3
2020				
Amish Gold Slicer	53.1	7.3	24.2	43.9
Artisan Orange Jazz	34.5	14.2	30.6	55.5
Bonny Best	78.3	5.5	26.9	48.8
Brandywine Pink	34.4	12.9	27.7	50.3
Cherokee Purple	34.9	10.5	22.9	41.6
Marianna's Peace	35.9	12.1	27.1	49.2
Old Brooks	61.9	6.4	24.8	45.0
Redfield Beauty	71.1	5.4	24.0	43.6
Slava	167.1	2.5	26.1	47.4
Trophy	66.8	6.3	26.3	47.7
Trucker's Favorite	68.1	7.4	31.5	57.2

* Total estimated yield = Average lbs/plant for 3630 plants/A (spacing 3' x 4')

Table 5. Timing of harvest in 2018 (average % of harvest)

	Before Aug. 15	Aug. 15 - Sept. 15	After Sept. 15
Hamden			
Brandywine Yellow	4	58	38
Carbon	13	46	41
Dester	1	66	33
Fireworks	12	38	50
Golden Jubilee	4	61	35
Granny Cantrell	3	66	31
Mrs. Maxwell's Big Italian	7	66	27
Mule Team	4	67	29
Paul Robeson	10	56	34
Wild Boar Pineapple Pig	0	60	40
Windsor			
Brandywine Yellow	8	43	49
Carbon	16	38	46
Dester	10	45	45
Fireworks	27	53	20
Golden Jubilee	4	46	50
Granny Cantrell	12	61	27
Mrs. Maxwell's Big Italian	12	56	32
Mule Team	5	50	45
Paul Robeson	12	48	40
Wild Boar Pineapple Pig	7	43	50

Table 6. Timing of harvest in 2019 (average % of harvest)

	Before Aug. 15	Aug. 15 - Sept. 15	After Sept. 15
Hamden			
Brandywine Orange	14	56	30
German Head	10	62	28
Giant Oxheart	25	48	27
Kanner Hoell	8	49	43
Missouri Pink Love Apple	7	70	23
Mushroom Basket	13	53	36
Mr. Stripey	8	48	44
Orange Oxheart	6	53	41
Striped German	8	52	40
Vintage Wine	13	67	20
Windsor			
Brandywine Orange	26	30	44
German Head	18	37	45
Giant Oxheart	27	32	41
Kanner Hoell	14	40	46
Missouri Pink Love Apple	23	39	38
Mushroom Basket	17	41	42
Mr. Stripey	14	38	48
Orange Oxheart	21	29	50
Striped German	22	33	45
Vintage Wine	22	36	42

Table 7. Timing of harvest in 2020 (average % of harvest)

	Before Aug. 15	Aug. 15 - Sept. 15	After Sept. 15
Hamden			
Amish Gold Slicer	10	65	25
Artisan Orange Jazz	12	49	39
Bonny Best	17	57	26
Brandywine Pink	19	48	33
Cherokee Purple	22	50	28
Marianna's Peace	16	42	42
Old Brooks	13	48	39
Redfield Beauty	4	53	43
Slava	22	56	22
Trucker's Favorite	10	53	37
Trophy	11	50	39
Windsor			
Amish Gold Slicer	22	46	32
Artisan Orange Jazz	32	31	37
Bonny Best	23	40	37
Brandywine Pink	35	30	35
Cherokee Purple	33	38	29
Marianna's Peace	32	29	39
Old Brooks	24	37	39
Redfield Beauty	14	48	38
Slava	43	31	26
Trucker's Favorite	20	50	30
Trophy	19	46	35