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Evaluation of ‘Mortgage Lifter’ Tomato for High Tunnel Production

Lewis W. Jett¹



Figure 1. The ‘Radiator Charlie Mortgage Lifter’ is a popular West Virginia heritage tomato variety.

Introduction:

The ‘Mortgage Lifter’ tomato has historical roots in West Virginia and central Appalachia. The strain which is most often associated with West Virginia is the ‘Radiator Charlie Mortgage Lifter’ which is a red to pink beefsteak slicing tomato (Figure 1). In 2018, several heritage tomato varieties were evaluated within high tunnels in West Virginia. High Tunnels significantly improved yield and quality of all varieties, and ‘Mortgage Lifter’ had marketable yields comparable to hybrid tomato cultivars. Wholesale marketing high tunnel tomatoes is usually not profitable but concentrating on unique, heritage varieties with high flavor for direct marketing is the best strategy for maximizing profit. Since there is a strong demand for heritage varieties unique to Appalachia, our objective in 2019 was to acquire ‘Mortgage Lifter’ seed from several commercial seed companies and local seed savers and determine which variety or landrace had optimal yield and quality within high tunnels. There is tremendous diversity in what is marketed as a ‘Mortgage Lifter’ tomato by several seed companies. Screening will help identify the best lines for commercial production of this heritage variety.

Materials and Methods:

Seed from ‘Mortgage Lifter’ tomato was sourced from several commercial seed companies including a local West Virginia seed saver. In addition, heritage x hybrid cross varieties were

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selected. The West Virginia yellow beefsteak heirloom tomato ‘Kellogg’s Breakfast’ and the bicolor heritage variety ‘Hillbilly’ were also selected for evaluation in addition to traditional hybrid high tunnel varieties such as ‘Big Beef’ and ‘Celebrity’ which are indeterminate and determinate, respectively.

Seeds were sown in mid-February in 200-cell trays filled with *Promix BX Organix* media and germinated in a mist bed at the WVU Evansdale Greenhouse. The 10-day old seedlings were re-potted in 50-cell Pro-trays and grown for an additional 6 weeks in the same greenhouse. Nine ‘Mortgage Lifter’ varieties/landraces were evaluated, and all plants were transplanted within a 30 ft x 96 ft high tunnel on April 10, 2019. Plants were spaced 30 inches apart within the row with rows 48 inches apart. Plastic mulch with 2 drip irrigation lines/row was used for all varieties. Each variety was randomized within the row with three plants per plot and three replications per variety. Prior to planting, preplant N-P-K was applied as 19N-19P-19K fertilizer. Supplemental N and K were applied weekly via fertigation beginning at harvest. Plants were irrigated a minimum of three times per week. Each plant was pruned to two stems. Harvest commenced on July 8, 2019 and data were collected through August. Marketable tomatoes were graded and weighed.

One landrace of ‘Mortgage Lifter’ (Territorial Seed) was also top grafted onto ‘Estamino’ rootstock to evaluate the effects of grafting ‘Mortgage Lifter’ tomato. The grafted plants were planted on May 15 and harvested from August through October. They were compared to ungrafted plants of the same landrace planted and harvested at the same time.

Results:

Table 1. Marketable yield of heritage tomato varieties grown within a high tunnel.

Variety	Seed Source	US #1/plant (no.)	US #2/plant (no.)	Total Mkt yield/plant (lbs.)	Culls/plant (no.)
Mortgage Lifter	<i>Sow True Seed</i>	3.1	2.9	5.5	1.0
	<i>Territorial Seed</i>	3.4	3.1	6.6	1.3
	<i>Southern Exposure Seed Exchange</i>	1.6	2.1	5.0	1.1
	<i>Southern Exposure Seed Exchange</i>	3.0	2.0	5.9	2.9
	<i>Baker Creek Seed</i>	2.0	3.8	6.2	3.3
	<i>R.L. Shumway Seed</i>	5.9	6.1	10.0	2.0
	<i>Park Seed</i>	4.7	5.7	8.7	1.4
	<i>Burpee Seed</i>	1.4	4.5	4.3	2.6
	<i>Seed Saver</i>	5.5	6.0	9.2	2.9
Hillbilly	<i>Territorial Seed</i>	5.9	8.5	7.1	6.0
	<i>R.L. Shumway Seed</i>	3.4	5.7	9.2	1.5
	<i>Seed Saver</i>	2.8	1.2	5.6	1.0
Kellogg's Breakfast	<i>Territorial Seed</i>	5.5	2.0	7.2	1.9
Brandy Boy F1	<i>Burpee Seed</i>	2.9	3.7	7.4	3
Big Brandy F1	<i>Territorial Seed</i>	4.6	2.8	7.6	2.4
Genuwine F1	<i>Territorial Seed</i>	5.6	6.0	8.4	3.4
Marbonne F1	<i>Johnny's Seeds</i>	5.6	5.3	11.9	3.7
Big Beef F1	<i>Johnny's Seeds</i>	10.2	9.8	14.4	4.1
Celebrity F1	<i>Johnny's Seeds</i>	8.6	9.0	11.6	4.9
Black from Tula	<i>R L. Shumway</i>	1.9	5.1	3.8	3.8

Data were collected over a 5-week period starting from July 8 and continuing to August 15, 2019. Additional yield was obtained past mid-August, but leaf mold eventually became serious in late August and resulted in plant death by mid-September for many of the plants.

‘Mortgage Lifter’ from *R.L. Shumway* and the West Virginia landrace were the highest yielding strains of this variety (Table 1). The *Shumway* strain was a pink-fruited ‘Mortgage Lifter’ while the Roane County seed saver variety was red. The ‘Mortgage Lifter VFN’ from *Southern Exposure Seed Exchange* (SESE) was also red-fruited and out yielded the ‘Radiator Charlie Mortgage Lifter’ from SESE.

The ‘Hillbilly’ *Shumway* seed was also the highest yielding strain compared with the other two seed sources. However, this strain had a lot of unmarketable fruit. The ‘Hillbilly’ strain from Roane County produced larger fruit with less culls. ‘Kellogg’s Breakfast’ had excellent yields of yellow/orange fruit. From the hybrid and heritage cross varieties, ‘Marbonne’ had the highest yield. The true hybrids, ‘Big Beef’ and ‘Celebrity’ had the highest total yield and were the firmest fruit compared with the heritage varieties. However, ‘Big Beef’ had some yellow shoulder disorder. ‘Celebrity’ is a determinate variety but had uniform fruit of good quality.

Table 2. Effect of grafting ‘Mortgage Lifter’ tomato.

Treatment	US # 1 (lbs./plant)	US #2 (lbs./plant)	Total marketable yield (lbs./plant)
Grafted	3.0	3.3	6.3
Non-Grafted	1.7	3.5	5.2
Significance	*	NS	*

Grafting increased marketable yield, particularly of US No. 1 tomatoes compared with non-grafting (Table 2). Grafted tomatoes had a larger number of US No.1 fruit relative to non-grafted plants.

Discussion:

‘Mortgage Lifter’ can be grown successfully using high tunnels in West Virginia. This variety has a distinct history in the state, so selecting superior strains for commercial production is important. Marketable yield and quality were very good with the majority of the ‘Mortgage

Lifter' strains with yields equal to hybrid cultivars. The best strains from this evaluation will be used to produce seed in 2020 for expanded production evaluation across West Virginia.