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# 2022 High Tunnel Fresh Market Determinate Tomato Cultivar Trial for Southern Illinois

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A determinate tomato cultivar trial was conducted at the University of Illinois Dixon Springs Agricultural Center (DSAC) located in southern Illinois (Pope County) during the 2022 growing season. The objective of this trial was to compare performance of thirteen fresh market determinate tomato cultivars in a high tunnel production system.

Transplants used in the trial were grown at DSAC and set on April 18, 2022. Plants were grown on in-ground raised beds with two runs of trickle irrigation (4-inch emitter spacing) per bed and without plastic mulch within a high tunnel. Plants were set 24 inches apart in a single row per bed. The spacing between beds within this high tunnel is 20 inches, making the spacing between rows 3.5 feet. Plants were grown using a trellis weave and pruned to below first cluster. All plots were in a randomized complete block design and replicated four times.

Weekly fertilizer applications were made through the drip irrigation system starting a week after transplanting on April 22 and ending the last week of August. The following fertilizer products were used during the growing season; 20-20-20, potassium nitrate, calcium nitrate, potassium sulfate, and magnesium sulfate, delivering a total of

- 110 lbs/acre of nitrogen
- 35 lbs/acre of phosphorus
- 400 lbs/acre of potassium
- 55 lbs/acre of calcium
- 9 lbs/acre of magnesium.

The high tunnel containing this variety trial was also included in a biological insect control project and served as the control tunnel. No insecticides were applied during the growing season except for three applications of a Bt product to control tomato horn worm, army worm, and tomato fruit worm. No fungicides were needed or applied during the growing season.

The plots were harvested 16 times during the period from June 14 to August 29, 2022. The harvested fruit was sorted and graded based on USDA grades and standards for U.S. No. 1 and U.S. No. 2 tomatoes <https://www.ams.usda.gov/grades-standards/tomato-grades-and-standards>, and yield data was recorded accordingly. U.S. No. 1 fruit was a minimum of eight ounces in size, well formed, well developed, and showed no signs of decay or injury.

Cultivars are listed in descending order of total pounds per plant of U.S. No. 1 fruit harvested in Table 1. 'Mountain Gem' had significantly higher yields of total pounds per plant U.S. No. 1 fruit over the course of the harvest season. 'Patsy' yielded significantly higher than all other varieties except 'BHN 589' in total pounds per plant of U.S. No. 2 fruit. Observations made during the season indicate that fruit quality on 'Mountain Gem', 'BHN 589', and 'Red Deuce' was very good; displaying smooth, large fruit with minimal cracking. Early season harvests showed little insect damage but harvests from late July and August suffered damage from thrips and stink bug. 'Patsy' was a consistent yielder with

uniform, smaller fruit. Fruit size of U.S. No. 1 grade across all varieties ranged from two thirds to three quarters of a pound per fruit, well above the minimum of half a pound per fruit required to meet U.S. No.1 grade. Every variety to some degree suffered from yellow shoulder disorder this growing season.

**Table 1.** Results of 2022 High Tunnel Fresh Market Determinate Tomato Variety Trial-DSAC.

2022 High Tunnel Fresh Market Determinate Tomato Variety Trial-DSAC*						
	Total No. 1 Yield**	Total No. 2 Yield	Total Marketable Yield	Total No.1 Fruit	Culls	Fruit Size
	-----U.S. No. 1-----		U.S. No. 1 & No. 2			U.S. No. 1
Cultivar	-----( <i>lbs per plant</i> )-----			-- <i>no./plant</i> --		( <i>oz/fruit</i> )
<i>Mountain Gem</i>	19.3 a	8.3	27.6	25.4	6.1	12.2
<i>Red Snapper</i>	14.5 b	10.7	25.2	18.5	7.7	12.5
<i>Red Deuce</i>	14.3 b	9.3	23.6	18.9	7.1	12.1
<i>Red Morning</i>	13.8 b	8.7	22.5	18.1	9.3	12.2
<i>Rambler</i>	13.7 b	7.3	21.0	18.0	5.1	12.2
<i>Thunderbird</i>	12.6 bc	11.8	24.4	17.2	9.8	11.8
<i>Patsy</i>	11.6 bcd	18.9	30.5	18.0	10.1	10.3
<i>STM 2255</i>	11.6 bcd	12.1	23.7	16.6	12.4	11.2
<i>Summerhaven</i>	11.5 bcd	12.9	24.4	17.0	10.0	10.8
<i>BHN 589</i>	10.6 bcd	14.3	24.9	15.5	8.2	11.0
<i>HM 8148</i>	9.2 cd	12.5	21.7	12.5	8.6	11.8
<i>Camaro</i>	9.0 cd	11.0	20.0	12.8	12.7	11.3
<i>BHN 871</i>	8.1 d	10.6	18.8	12.7	3.7	10.2
*data analyzed across 4 replications						
**descending order based on Total Yield No. 1.				LSD 4.012		

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