

# PERFORMANCE OF GRAFTED AND NON-GRAFTED TOMATOES AMONG FOUR CULTIVARS IN A VIRGIN HIGH TUNNEL SYSTEM

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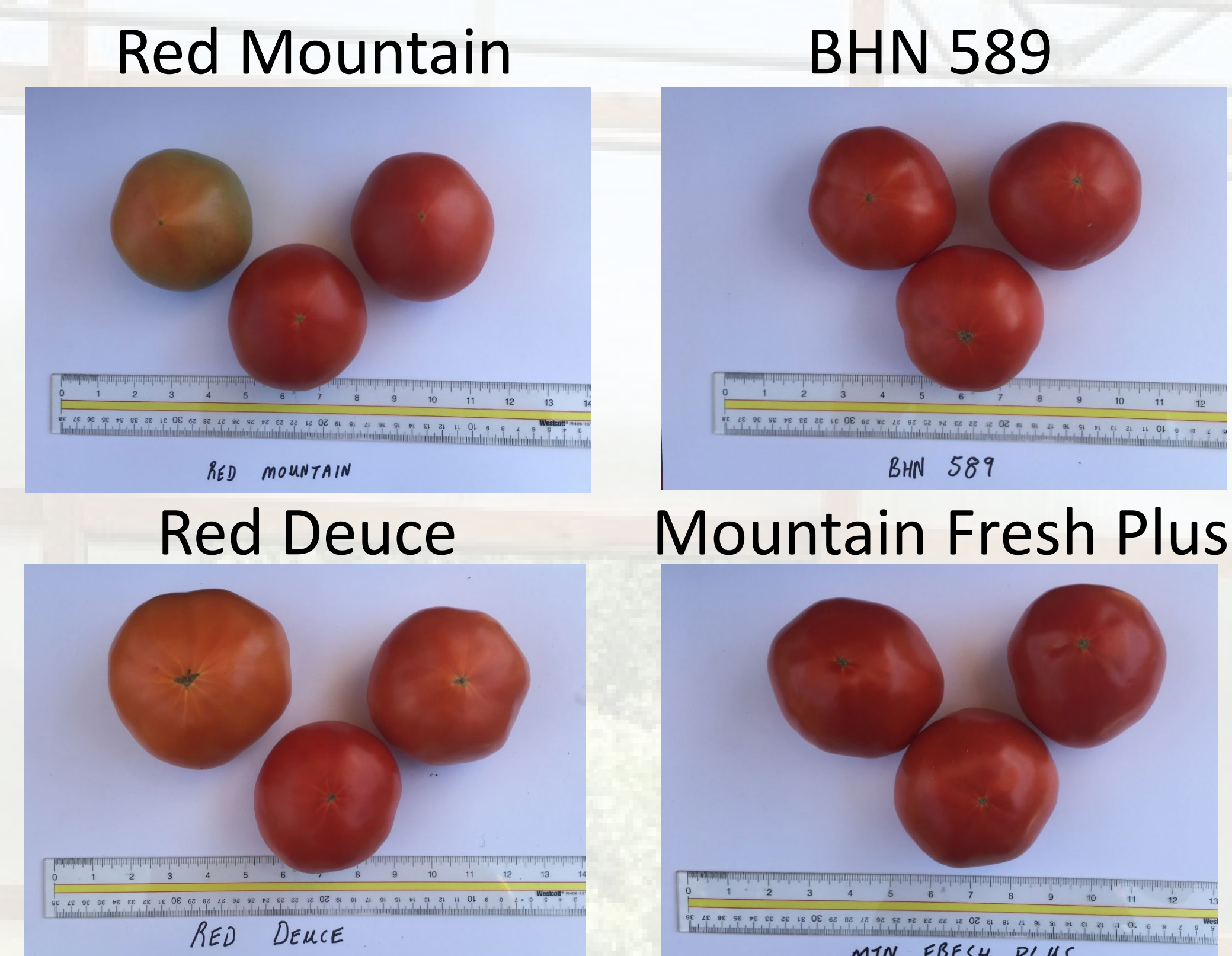
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## Question:

Does grafting tomato plants in a virgin high tunnel site with low disease and pest pressure pay?

## Background:

Grafting high tunnel tomatoes has shown to improve plant vigor, yield, and disease resistance, however grafting also is more expensive and can delay first harvest by 3-5 days. In sites with limited rotation and thus high disease and pest pressure, the added expense is easily justified. However, in new sites with low disease inoculum levels, the utility of grafting is still uncertain. A study was undertaken in 2019 to examine the effect of grafting on tomato performance of four cultivars in a virgin high tunnel site with no history of vegetable production and very low disease and pest pressure.



## Methods:

The study utilized a randomized complete block design with five replications (row). Cultivars Red Deuce, Red Mountain, BHN 589 and Mountain Fresh Plus were randomly assigned within each row. Each cultivar replicate contained three plants grafted to Maxifort root stock and three own-rooted plants. The trial utilized standard horticultural practices throughout the growing season. Fruit were harvested over a 60 day period as they ripened and were separated by size and quality using the standard USDA grading system. Total mass and fruit number were recorded for each grade. A consumer survey of taste and overall quality was conducted at area farmers markets. Data was analyzed and means separated using the Tukey's Honest Significant Difference test.

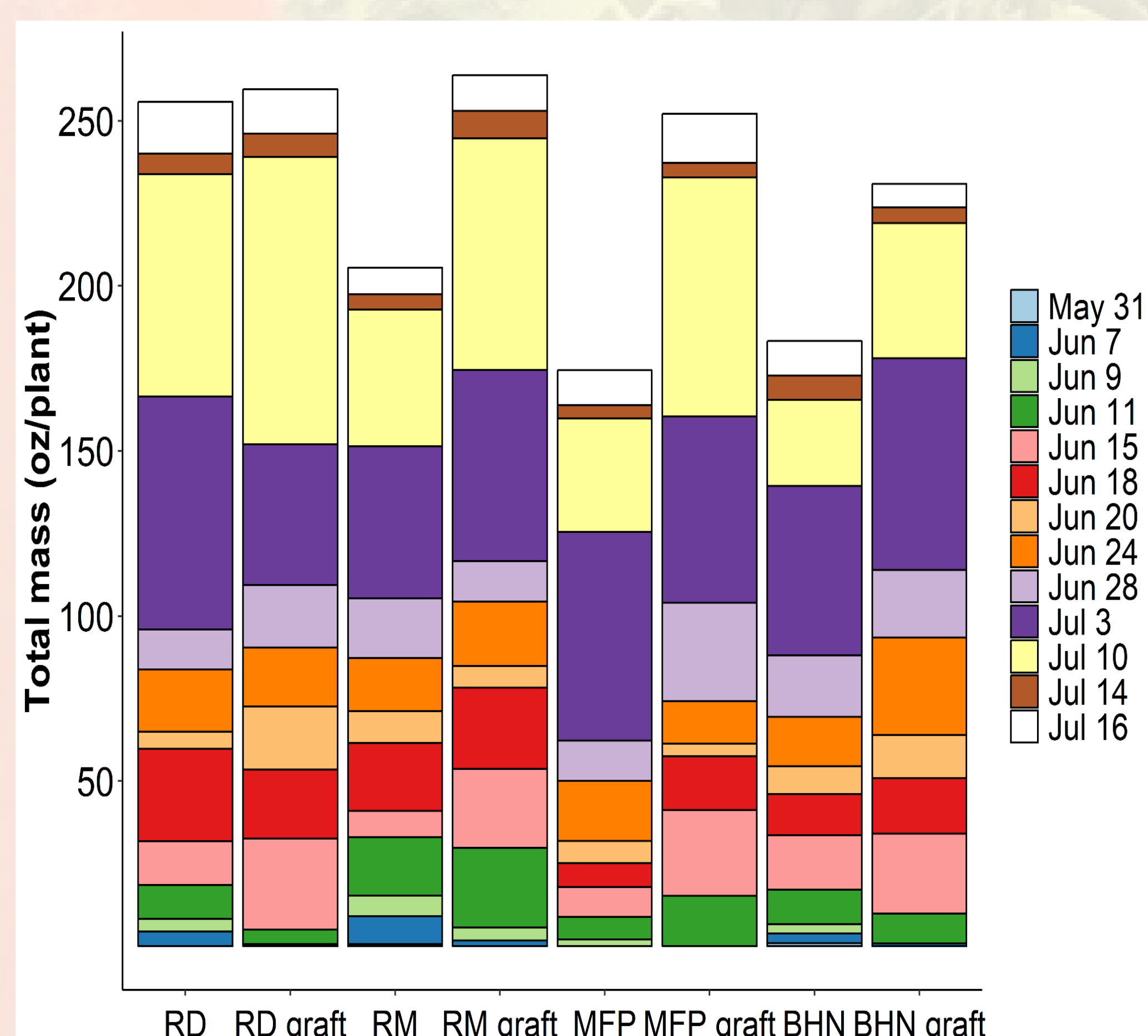
## Farmers Market Consumer Survey:

43 respondents at a local farmers market ranked each cultivar on a scale of 1-5 (1 being least and 5 best) for taste, texture and overall impression.

Cultivar	Taste	Texture	Overall
BHN 589	3.93	4.05	4.05
Red Deuce	3.27	3.49	3.39
MTN Fresh	3.26	3.43	3.33
Red Mountain	2.74	3.05	2.90

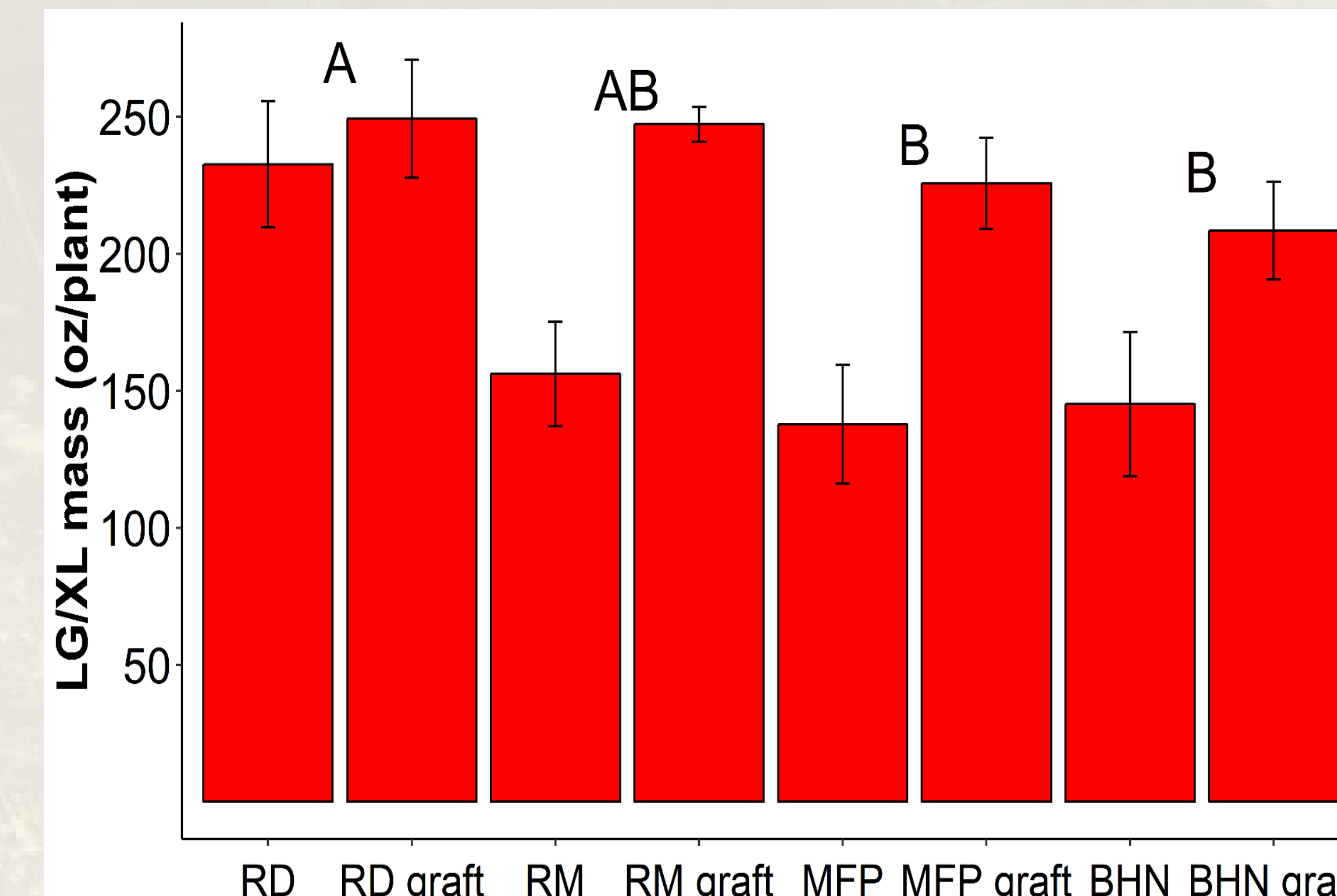
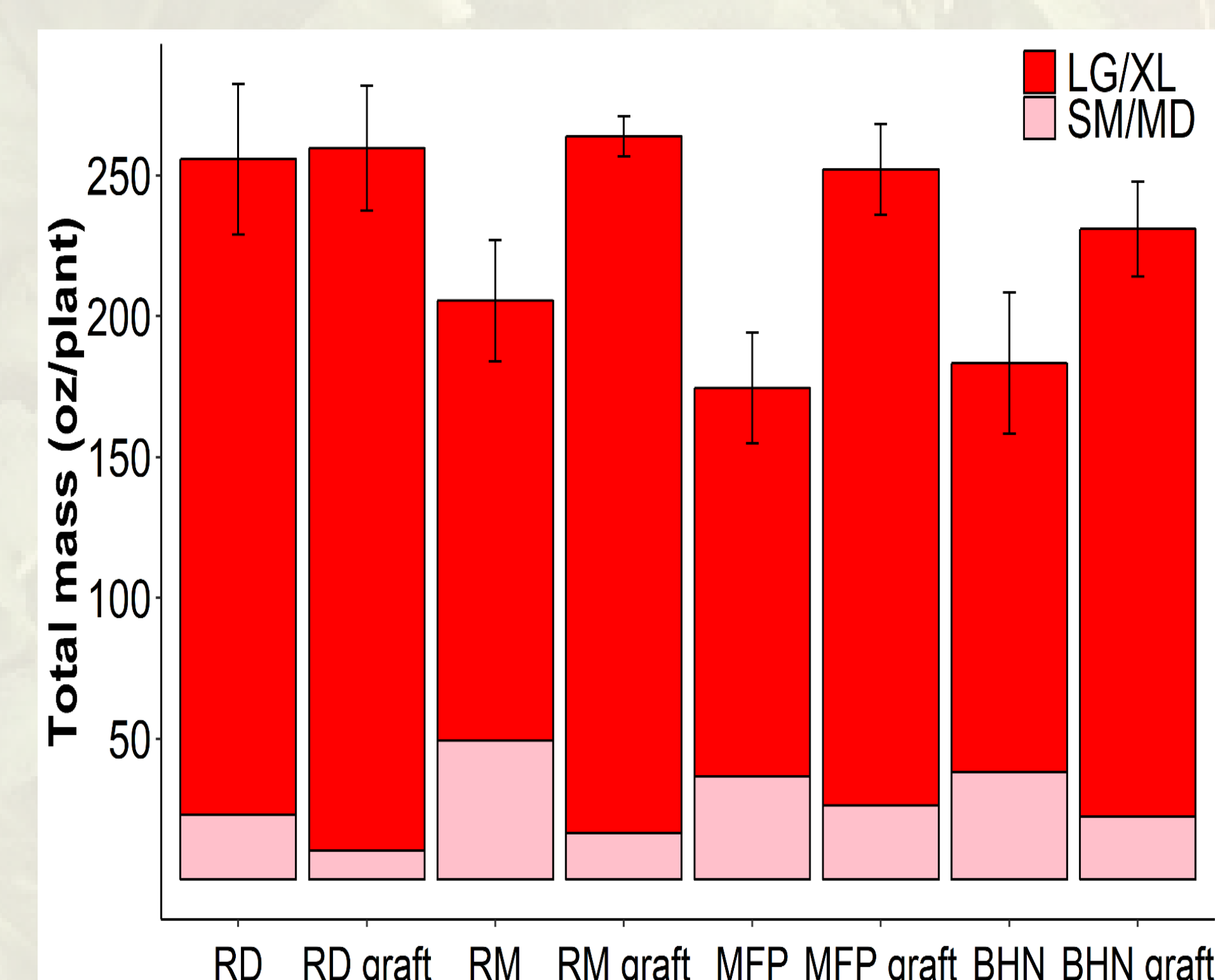
## Findings:

- Grafted plants yielded significantly more than non-grafted plants even on a virgin field site with no crop/pathogen history.
- Grafting increased the yield of extra large and large fruit, with non-grafted plants having significantly more mass and number of medium and small fruit.
- Tomato cultivar had a significant effect on extra large and large fruit mass, with Red Deuce and Red Mountain yielding the most.
- The first harvest of fruit from non-grafted plants was approximately 5-7 days earlier than grafted plants.
- The increased yield from grafting averaged across all cultivars was 46.9 ounces, resulting in an increased value of \$8.79 per plant using the 2019 wholesale market value for that time frame.
- Given a custom grafting cost of \$1.05 per plant, grafting provided an increased return of \$7.74 per plant.



Fruit yield by harvest date. Non-grafted plants produced first fruit 5-7 d earlier than grafted plants.

Grafting had significant effect on total yield with greater mass of fruit than non-grafted ( $P = 0.001$ ).



Both main effects are significant, so grafted plants have a greater mass of LG/XL fruit, and some varieties did better than others when averaging across grafted/un-grafted yield. Different letters represent significant differences among tomato varieties using Tukey's HSD Test.