Midwest Apple Improvement Association (MAIA) Cultivar Trial Update, 2025

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Introduction

The Midwest Apple Improvement Association (MAIA) was established to develop apple cultivars specifically adapted to the climatic conditions and production challenges of the Midwestern United States. Apple growers in this region frequently contend with extreme winter temperatures, variable spring weather, and disease pressure which can limit the performance of cultivars developed for more temperate growing regions. As a result, regionally adapted cultivars with strong horticultural performance and desirable fruit quality are needed for maintaining profitable apple production for small scale production.

Several MAIA cultivars, including EverCrisp apple, Rosalee apple, and Ludacrisp apple, have recently been released and are being adopted by growers across the region. Cultivar trials are essential for evaluating the performance of these selections under diverse environmental conditions and management systems. This study evaluates the horticultural performance of MAIA cultivars in regional trials, with the goal of providing growers with information on growth, productivity, and fruit quality to support cultivar selection and orchard management decisions.

Materials and Methods

In 2021, the MAIA orchard was established on Geneva.41 rootstocks with 12ft rows and 4 ft between trees in a quasi- high-density system. Trellis posts are 40 ft spaced with nine trees per panel. Cultivars are arranged in five blocks, with each block having three rows of eight cultivars for a total of 15 rows. Fruit is hand-thinned around 15 mm diameter. Harvest is conducted by panel which each cultivar having 15 panels. Due to the block design of the orchard, there are three technical replicates in each block and five block replicates for statistical purposes. The orchard contains the MAIA cultivars Evercrisp, Rosalee, Ludacrisp, Summerset, the NY cultivar Autumn Crisp, and Rising Sun Fuji and Brooksfield Gala.

Results

Yield varied among cultivars during the evaluation period, reflecting differences in early productivity and fruit size among selections. Among the MAIA cultivars, Ludacrisp apple produced the highest average yield (218.9 ± 79.5 lbs per panel) and a relatively high fruit count (623.4 ± 218.9 apples). Rosalee apple produced moderate yields (158.5 ± 116.8 lbs) with lower fruit numbers (387.1 ± 158.5 apples), suggesting comparatively larger fruit size, however the size was fairly evenly distributed (Table 2). EverCrisp apple had lower average yields (148.8 ± 62.4 lbs) and moderate fruit counts (476.1 ± 148.8 apples), while Summerset apple produced similar yields (128.9 ± 34.1 lbs) with moderate fruit numbers (390.8 ± 128.9 apples). Sweet Zinger apple produced 138.5 ± 47.1 lbs with 496.9 ± 138.6 apples on average. Among the comparison cultivars, Autumn Crisp apple produced intermediate yields (178.7 ± 99.0 lbs) and 522.9 ± 178.7 apples. Brookfield Gala apple showed relatively strong production (236.8 ± 53.5 lbs) with 622.2 ± 236.8 apples. Rising Sun Fuji apple produced the highest yield overall (339.3 ± 160.0 lbs) and the greatest number of fruit (1,000.4 ± 361.0 apples). Across cultivars, relatively large standard errors indicated substantial variability among blocks and panels within the orchard.

Discussion

The results demonstrate differences in early productivity among the MAIA cultivars relative to established commercial cultivars. Among the MAIA selections, Ludacrisp apple showed comparatively strong yield potential, producing the highest fruit number and total weight within the group. This suggests that Ludacrisp may have strong cropping potential in high-density systems under Midwestern conditions. In contrast, EverCrisp apple and Rosalee apple produced moderate yields during the evaluation period. Similarly, Summerset apple and Sweet Zinger apple exhibited moderate productivity, though continued monitoring will be necessary to determine their long-term yield potential as the orchard matures. When compared with established cultivars such as Brookfield Gala apple and Rising Sun Fuji apple, some MAIA cultivars produced lower total yields. However, these differences may partially reflect the young age of the planting and cultivar-specific differences in early bearing behavior. In particular, Rising Sun Fuji exhibited very high fruit numbers, which contributed to the highest total yield in the trial.

The relatively large variability among panels suggests that site factors, tree vigor, or crop load management may influence performance within the orchard. Crop load management in cultivar plantings is difficult; as such the Brookfield Gala and Rising Sun Fuji were not adequately thinned. As the planting continues to mature, additional years of data will be important for determining stable yield patterns and evaluating fruit quality and management characteristics. Overall, these results highlight the importance of regional cultivar trials for assessing the productivity of new MAIA cultivars under Midwestern growing conditions and for guiding cultivar selection by growers.

Table 1. Average total pounds and number of apples per cultivar in 2025.

Cultivar	Evercrisp	Ludacrisp	Rosalee	Summerset	Sweet Zinger	Autumn Crisp	Brookfield Gala	Rising Sun Fuji
Avg. total lbs. of apple ± Stderr	148.8 ± 62.4	218.9 ± 79.5	158.5 ± 116.8	128.9 ± 34.1	138.5 ± 47.1	178.7 ± 99.0	236.8 ± 53.5	339.3 ± 160.0
Avg. total no. of apple ± Stderr	476.1 ± 148.8	623.4 ± 218.9	387.1 ± 158.5	390.8 ± 128.9	496.9 ± 138.6	522.9 ± 178.7	622.2 ± 236.8	1000.4 ± 361.0

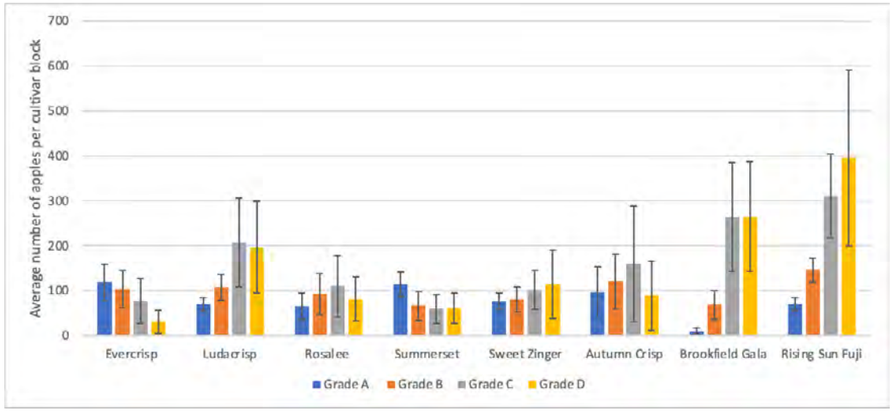

Figure 1. Average number of apples per cultivar per block in 2025. Grades constitute size, with A being the largeset and D being the smallest.

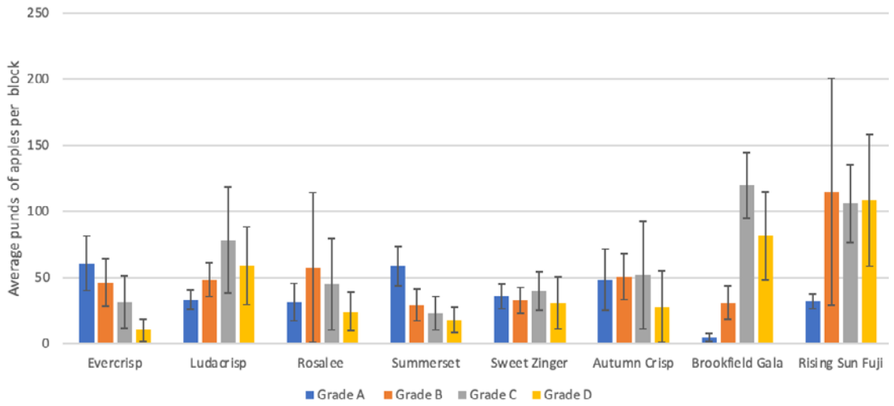

Figure 2. Average weight of apples per cultivar per block in 2025. Grades constitute size, with A being the largest and D being the smallest.