

EVALUATING THE PERFORMANCE OF ARMILLARIA ROOT ROT RESISTANT ROOTSTOCK 'MP-29' FOR SUSTAINABLE PEACH PRODUCTION IN ALABAMA

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HYPOTHESIS:

Armillaria root rot (ARR) disease caused by the soilborn fungus *Desarmillaria caespitosa* is the second leading cause of peach tree mortality in the southeastern United States. Currently available chemical controls are not considered to be cost effective. Guardian® is presently the dominant rootstock for the southeastern peach industry primarily due to its superior tolerance to peach tree short life (PTSL). However, Guardian® is highly susceptible to the ARR pathogen. 'MP-29' is a recently released clonal interspecific hybrid peach rootstocks that provides superior resistance to ARR without the adverse effect on scion fruit size and productivity (Beckman et al., 2012). 'MP-29' is also a semi-dwarf rootstock that provides tree size control. Science based data is currently lacking on the performance of 'MP-29' in Alabama conditions.



Figure 1. 'Julyprince' and 'Bounty' trees grafted on Guardian and MP-29 grown at the CREC, AL, 2019.

OBJECTIVES:

- To evaluate the rootstock tolerance to ARR and determine the rootstock effect on tree vigor, phenological development, yield, and fruit quality of 'Julyprince' and 'Bounty' peaches.

MATERIALS AND METHODS:

- 'Julyprince' and 'Bounty' trees grafted on the standard 'Guardian' and 'MP-29' rootstocks
- Planted at a site with a documented ARR history at the Chilton Research and Extension Center, (CREC), AL in 2019
- The experimental design is a randomized complete block with 12 single tree replications
- Planted at a distance of 15' X 20'
- Conventional orchard system

RESULTS:

- 'MP-29' had a significant effect on the vegetative growth as measured by the trunk cross sectional area (TCSA), (Figure 2). Both 'Julyprince' and 'Bounty' trees on 'MP-29' were 62% the size of trees on 'Guardian'.



Figure 2. Similar rootstock effect on 'Bounty' fruit weight.

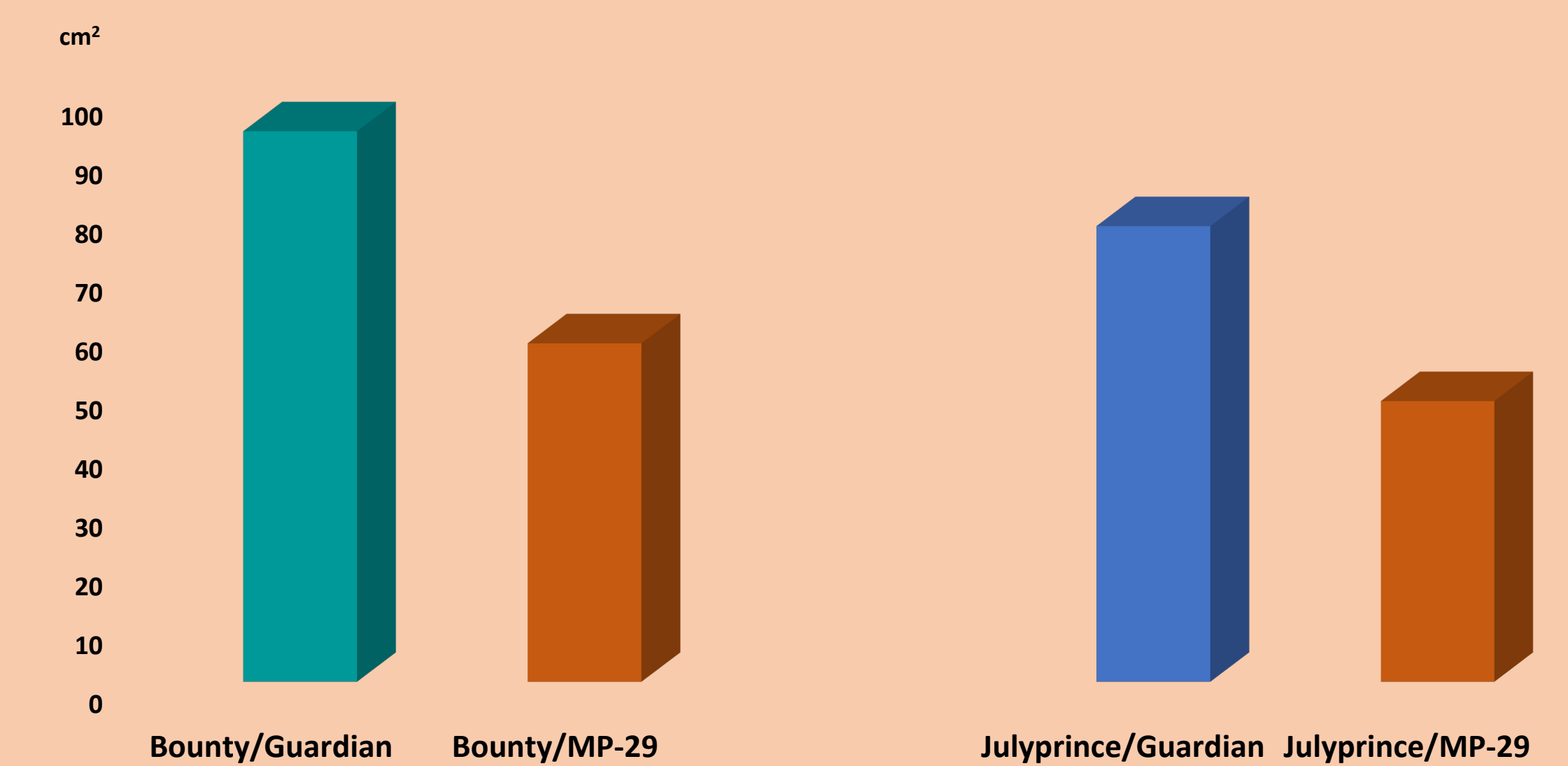


Figure 3. Rootstock effect on 'Julyprince' and 'Bounty' TCSA, cm².

- 'Julyprince' and 'Bounty' produced similar number of fruit per tree, total yield/tree and yield efficiency regardless of rootstock (Figures 4, 5, and 6).

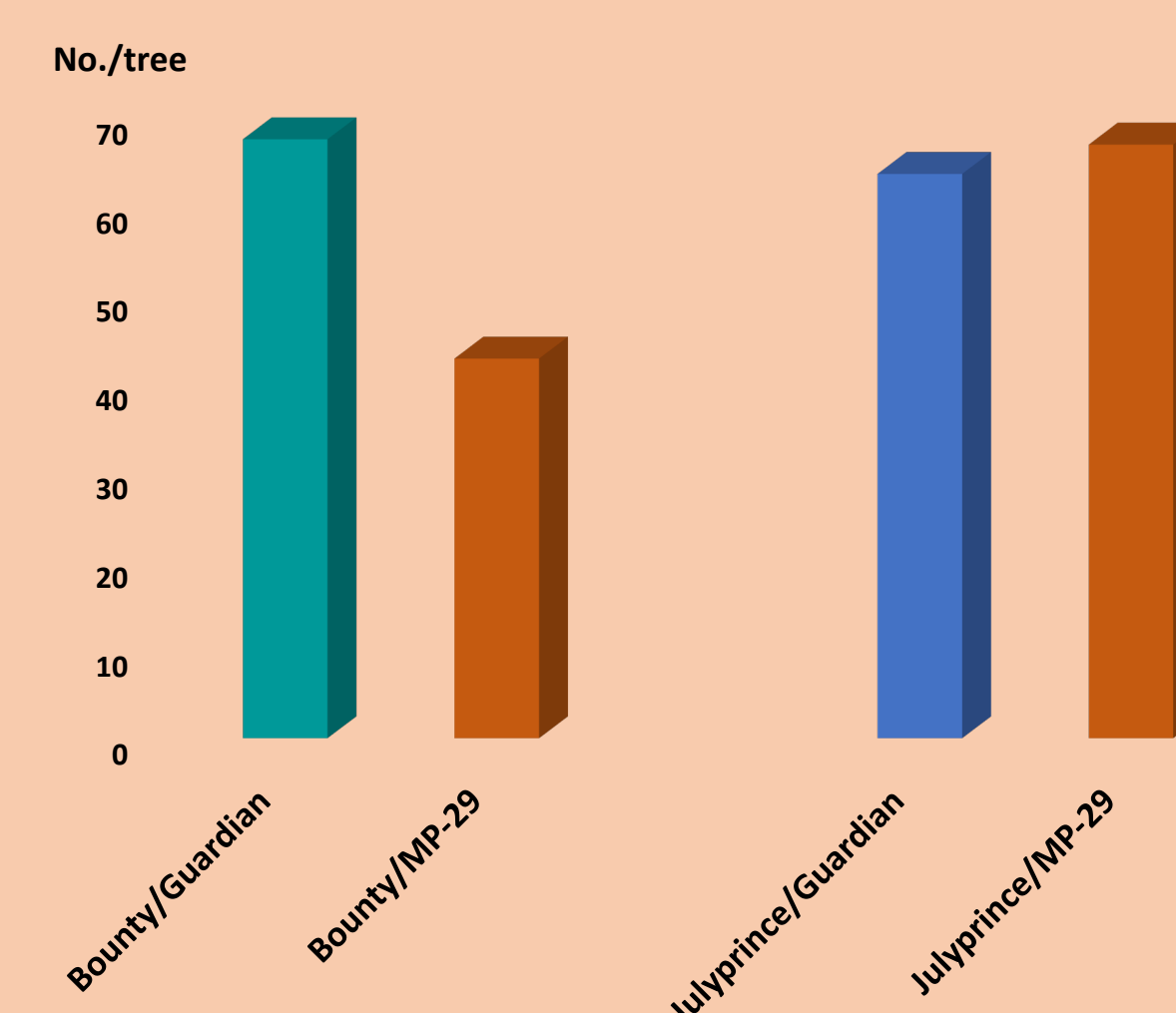


Figure 4. Rootstock effect on number of fruit/tree.

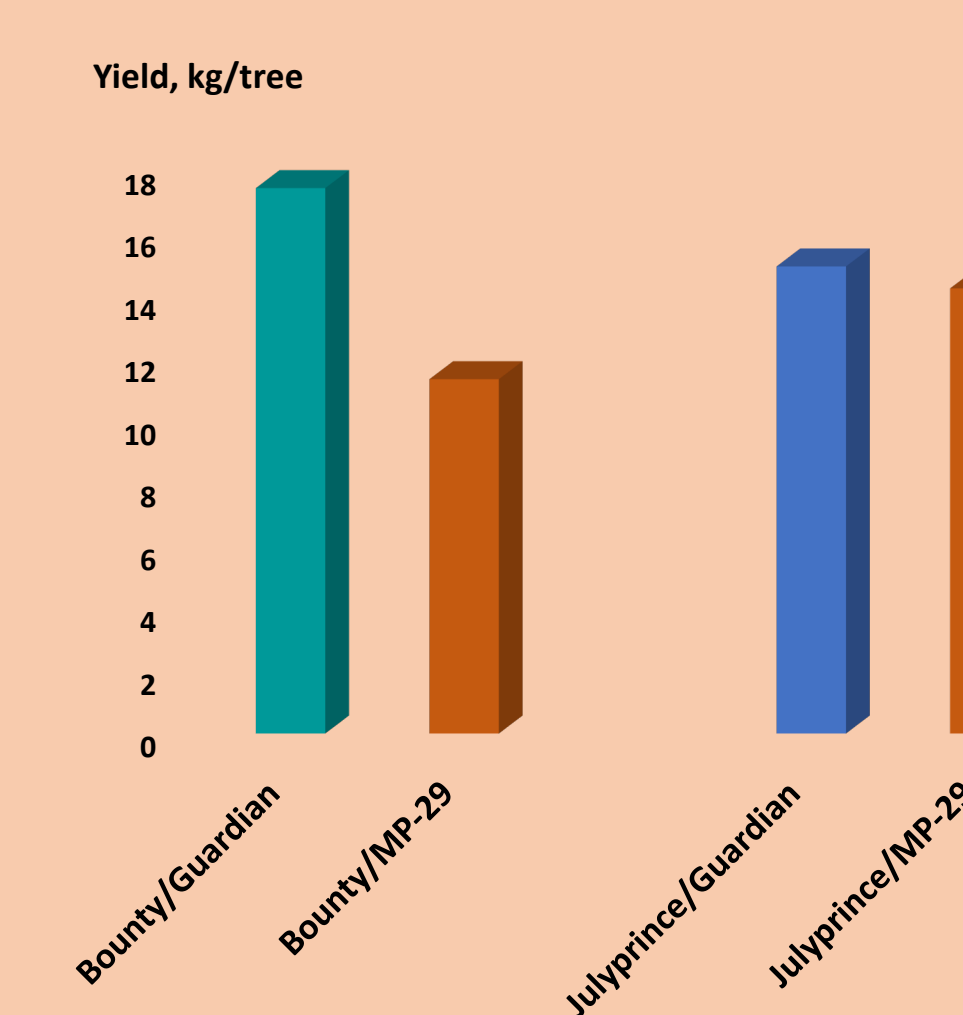


Figure 5. Rootstock effect on total yield.

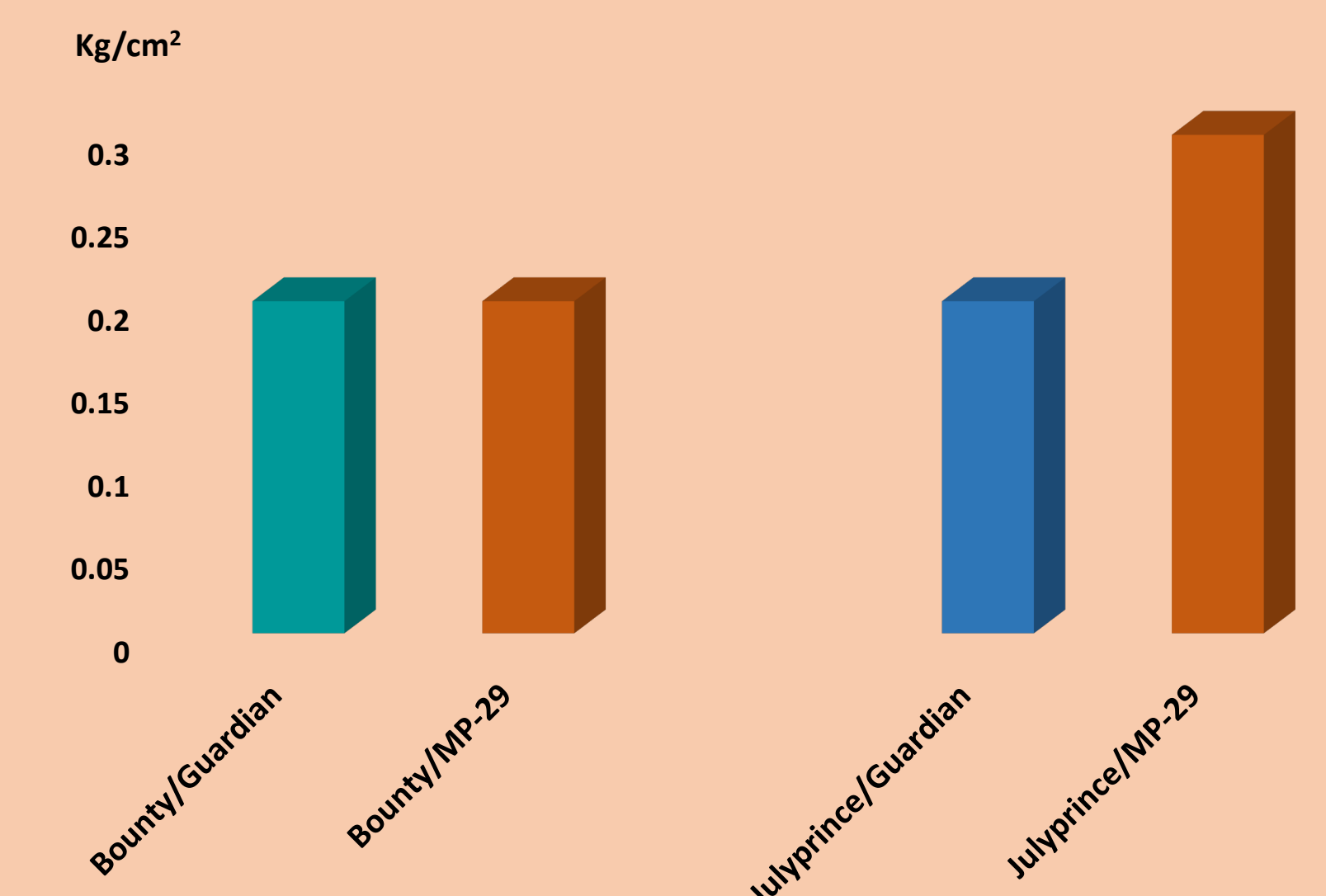


Figure 6. Rootstock effect on yield efficiency.

- 'MP-29' grafted 'Bounty' trees produced sweeter fruit (Fig. 2, Table 1).

Table 1. Rootstock Effect on Fruit Quality, 2021

	Mean Fruit Wt, g	SSC, %	Firm. 1, kg/cm²	Firm. 2, kg/cm²
Bounty/Guardian	279.3 a	11.7 b	2.6 b	2.6 b
Bounty/MP-29	289.3 a	12.4 a	2.1 b	2.5 b
Julyprince/Guardian	247.9 b	12.4 a	3.0 a	3.0 a
Julyprince/MP-29	238.0 b	12.0 ab	2.8 a	3.0 a

Figure 7. Rootstock effect on fruit quality of 'Bounty' peaches.



SUMMARY:

- 'MP-29' significantly reduced the size of 'Julyprince' and 'Bounty' trees
- Similar total yield, number of fruit /tree and yield efficiency regardless of rootstock
- 'MP-29' grafted 'Bounty' had a sweeter fruit