

Evaluating Host Resistance to Verticillium Wilt in Strawberry - 2021

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In the fall of 2020, our fifth replicated field trial was established to evaluate 51 strawberry cultivars and elite selections for resistance to Verticillium wilt caused by *Verticillium dahliae*. Strawberry germplasms were selected from four breeding programs: University California, Davis (UCD), Driscoll's (D), Plant Sciences (PEP, PS, BG), and Lassen Canyon (LC). On 2 Nov 2020, bare-root strawberry transplants were set in field 25 on the Cal Poly San Luis Obispo farm; this field has a history of Verticillium wilt due to decades of vegetable cropping. Strawberries have never been cultivated in this field. Lettuce 'Black Seeded Simpson' was planted on 5 June 2020 and disked in order to increase the *Verticillium dahliae* population. Approximately 9 colony forming units of *Verticillium* spp. per gram of soil was measured prior to transplanting. The trial consisted of 20-plant plots replicated four times, with a fifth block bed fumigated with Tri-Chlor EC (94% chloropicrin at 240 lb/A). The first Verticillium wilt symptoms were observed in early March 2021 and presence of the pathogen in plants was confirmed using standard plating and molecular techniques. Disease assessments were conducted every two weeks. Plants were considered dead when 50% of all foliage was necrotic.



Fig 1. Aerial photo of the Verticillium wilt host resistance trial located in field 25, block 6, on the Cal Poly San Luis Obispo farm. The area outlined in red was not fumigated and naturally infested; the area outlined in yellow was fumigated in October of 2020. (Photo taken 4 July 2021)



Fig 2. A) The first symptoms of Verticillium wilt (plants circled in yellow) appeared in early March; B) *Verticillium dahliae* growing out from one end of an infected strawberry petiole plated on a semi-selective medium, NP-10.



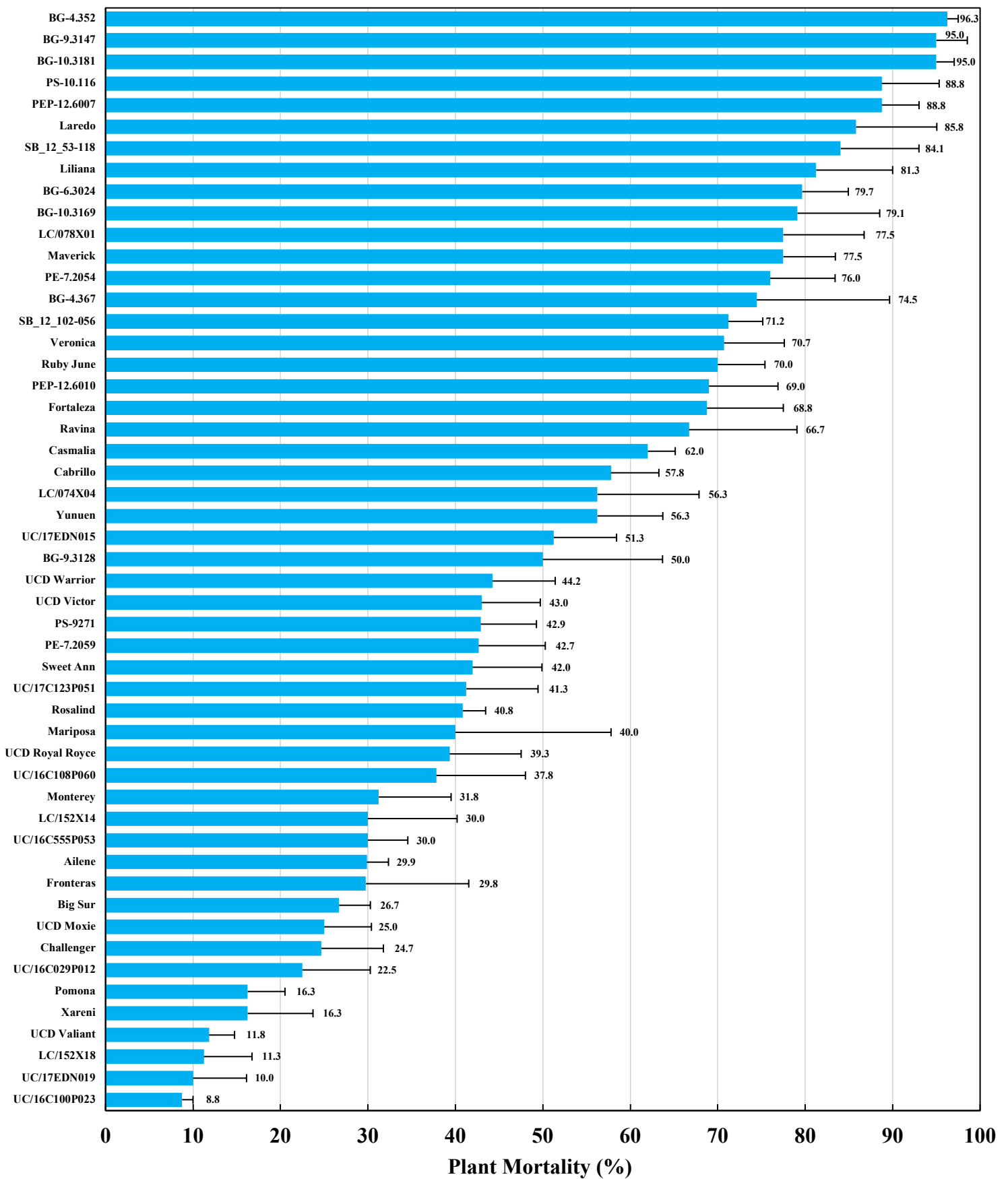


Fig 3. Average percent mortality due to Verticillium wilt on 12 July 2021.

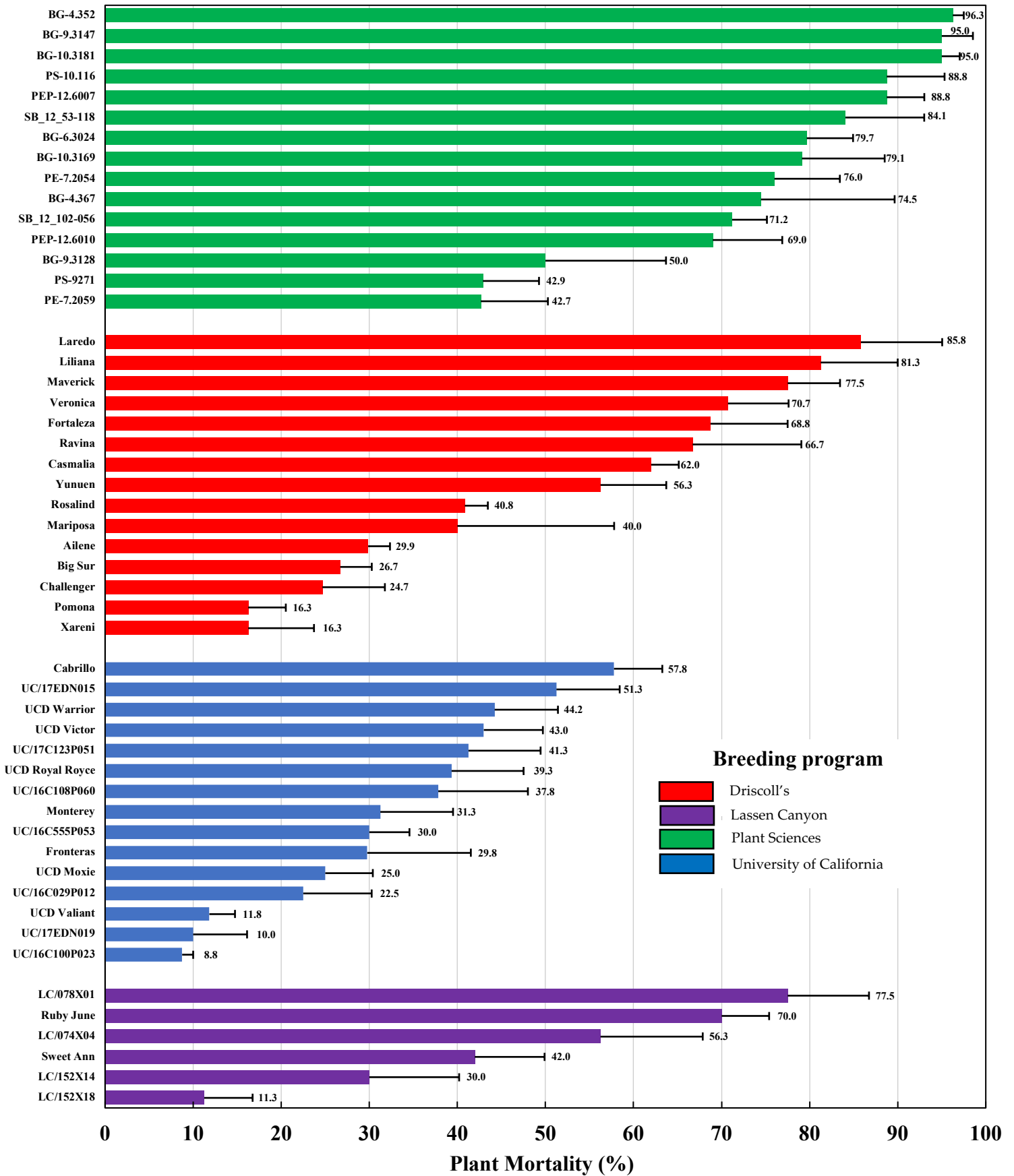


Fig 4. Average percent mortality due to Verticillium wilt (by breeding program) on 12 July 2021.

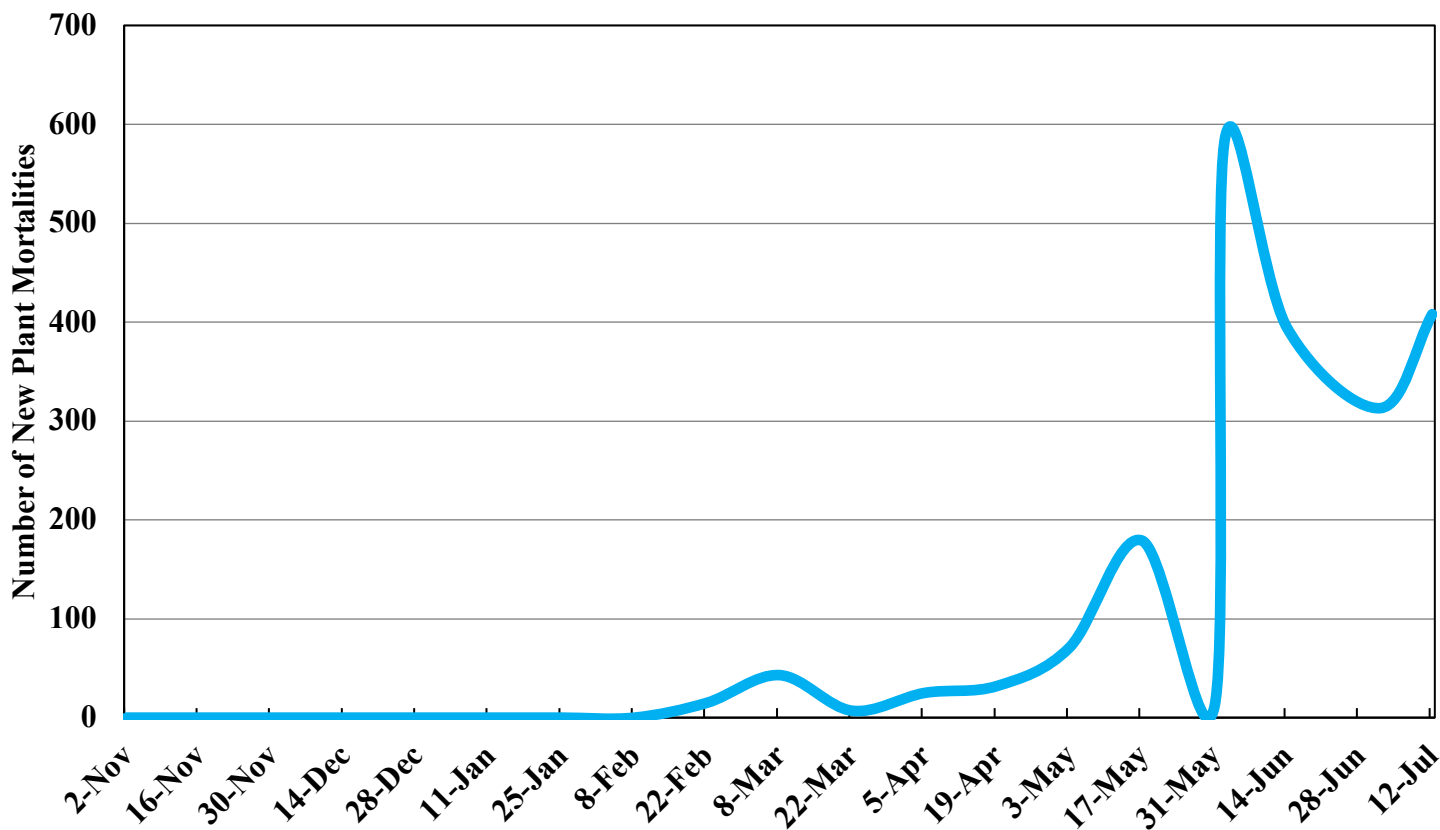


Fig 5. Number of new mortalities across all genotypes due to Verticillium Wilt.

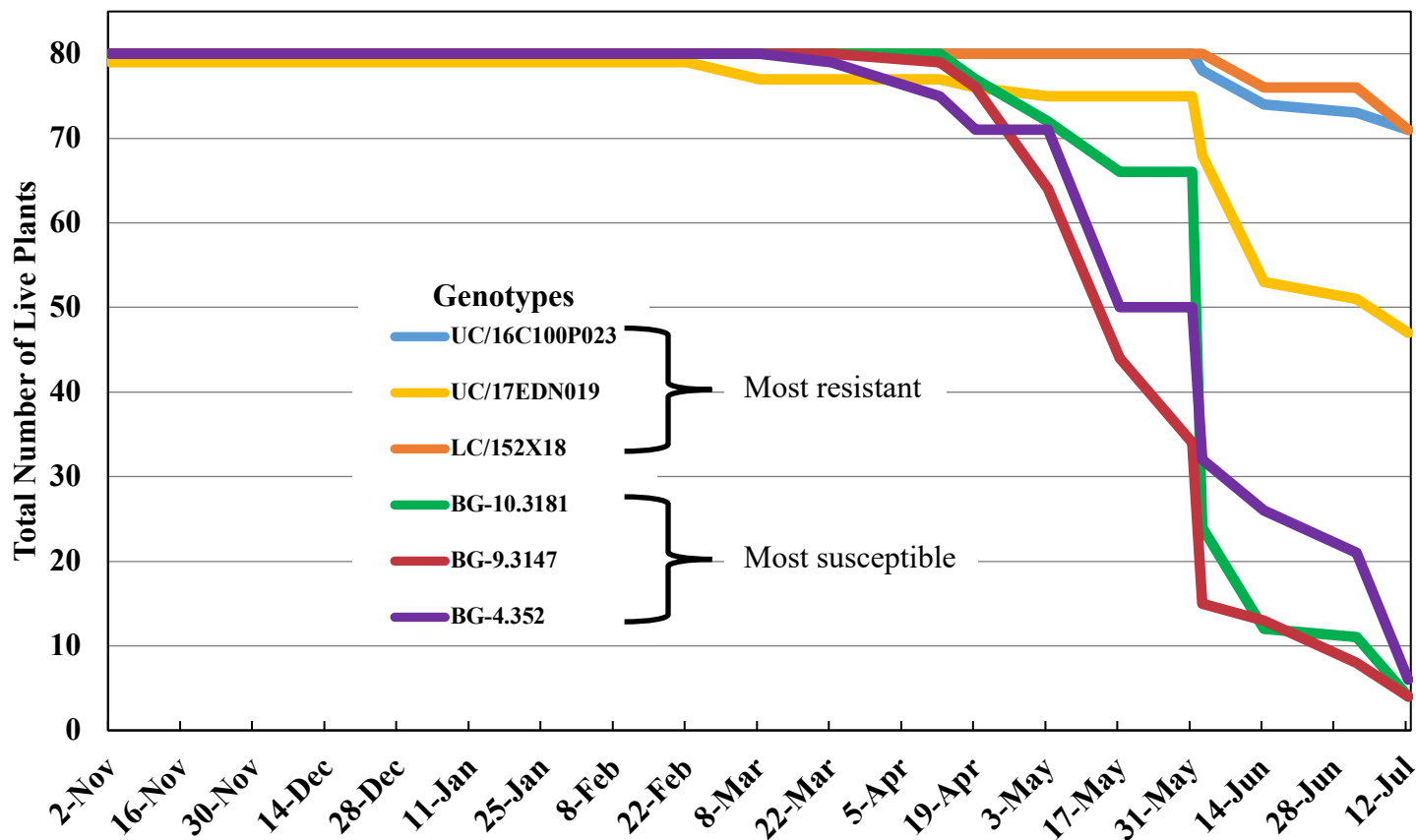


Fig 6. Survivability of 3 most susceptible and 3 most resistant genotypes to Verticillium Wilt.

