

Evaluating host resistance to *Verticillium* wilt in strawberry

M. G. Alvarez Arredondo, S. S. Hewavitharana, and G. J. Holmes

The 2024-25 season marks the ninth year of an ongoing field study aimed at assessing resistance to *Verticillium* wilt in strawberry, caused by *Verticillium dahliae*. This year's trial included 81 cultivars from eight breeding programs/nurseries: Crown Nursery, Driscoll's, Good Farms, Lassen Canyon, Pinnacle Berry Genetics, Planasa, Plant Sciences, and UC Davis. Bare-root transplants were established in field 25, block 4 at Cal Poly San Luis Obispo, a site with a documented history of *Verticillium* wilt. Planting occurred primarily on 31 Oct 2024, with additional transplants from UC Davis and a few Driscoll's selections added on 5 Nov 2024. The field was not fumigated prior to planting, allowing natural inoculum levels (7.81 CFU/g soil) to drive disease pressure. Cultivars were arranged in 20-plant plots, though some plots contained slightly fewer plants due to limited transplant availability. Each cultivar was replicated across four blocks. Symptomatic plants were sampled to confirm the presence of *V. dahliae* through standard plating techniques. Mortality assessments took place every week (Fig. 3 and 4) and canopy loss per day (Fig. 5), with plants classified as dead once 50% or more of the foliage exhibited necrosis. Notably, growth across the field was uneven. Certain areas, particularly toward the center and rear of the field (Fig. 1), exhibited weaker plant establishment and reduced vigor. In contrast, plants in block 1 developed a noticeably larger canopy compared to other replicates, suggesting more favorable localized growing conditions that may have influenced disease expression and overall plant performance.

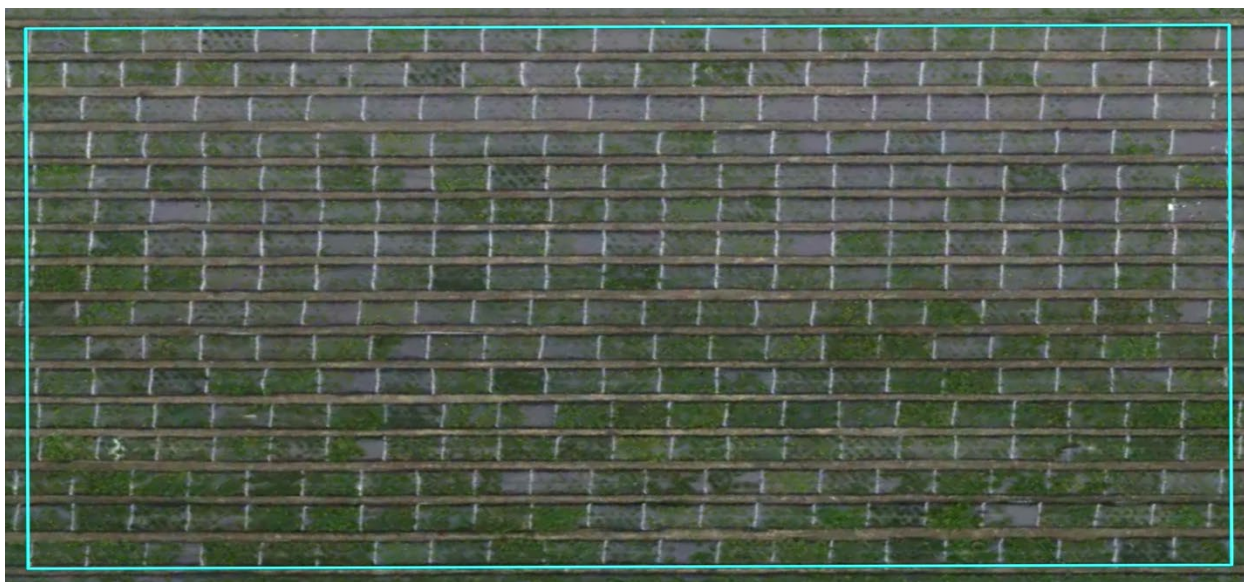


Figure 1. Aerial image of the *Verticillium* wilt host resistance field trial on 27 Jun 2025, located in field 25 block 4 on the Cal Poly SLO farm. The trial area is outlined in blue.

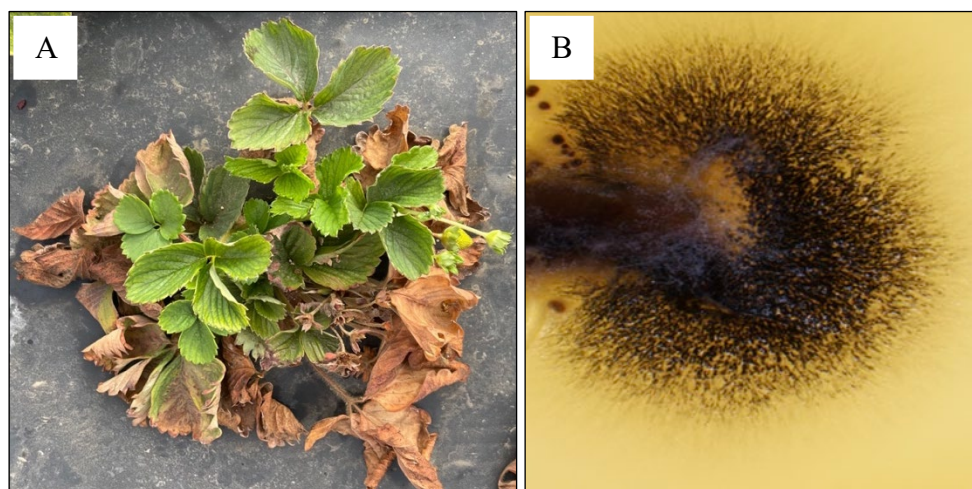


Figure 2. A) Symptoms of *Verticillium* wilt B) *Verticillium dahliae* growing out from one end of an infected strawberry petiole plated on a semi-selective medium (NP-10).



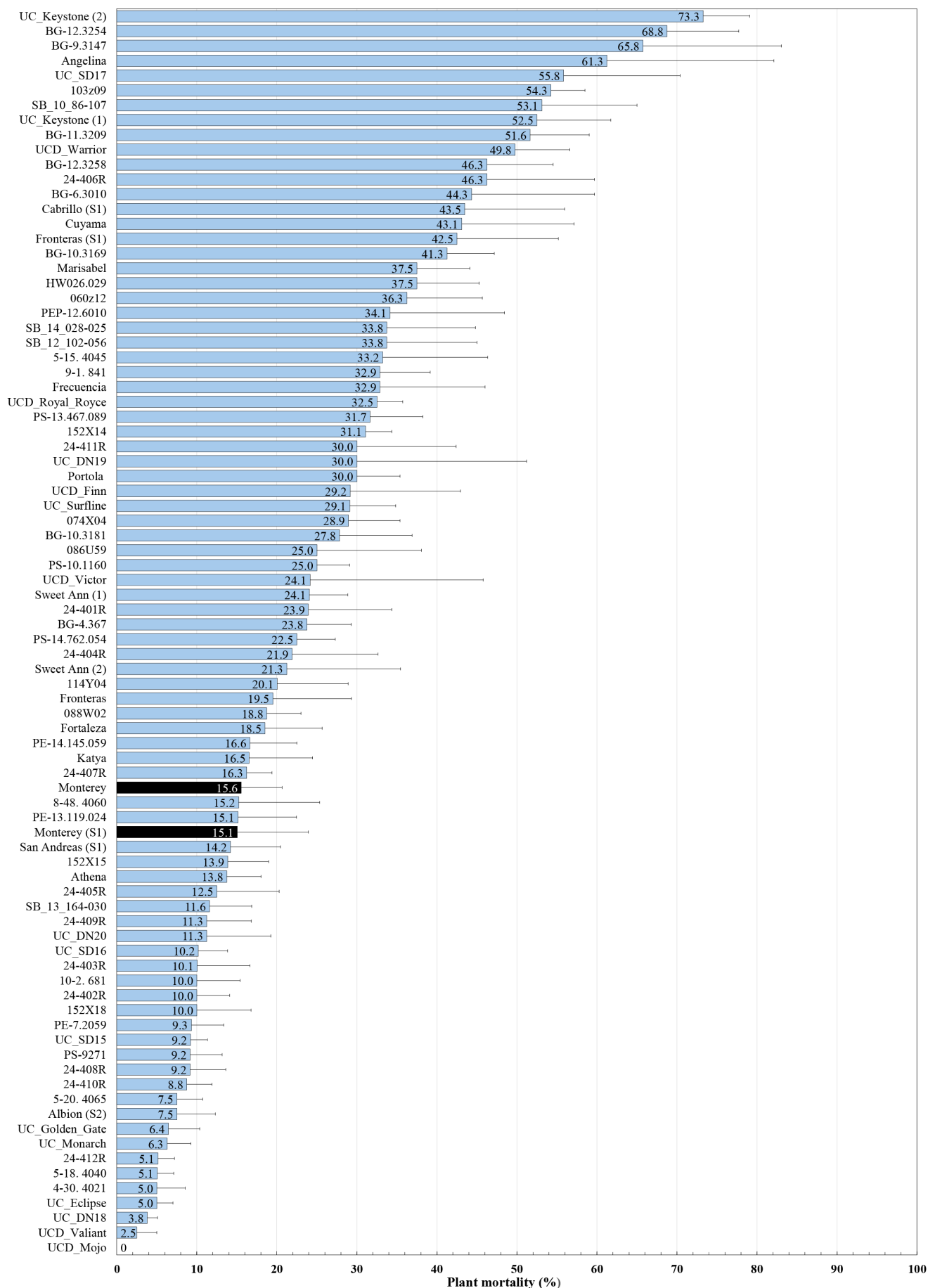


Figure 3. Average percent plant mortality due to *Verticillium* wilt as of 03 Jul 2025. Error bars represent standard error from four replicates per genotype (n=4). UC_Keystone (1) and UC_Keystone (2), as well as Sweet Ann (1) and Sweet Ann (2), are from the same source but are duplicate entries in the trial. S1 and S2 represent different plant sources/nurseries.



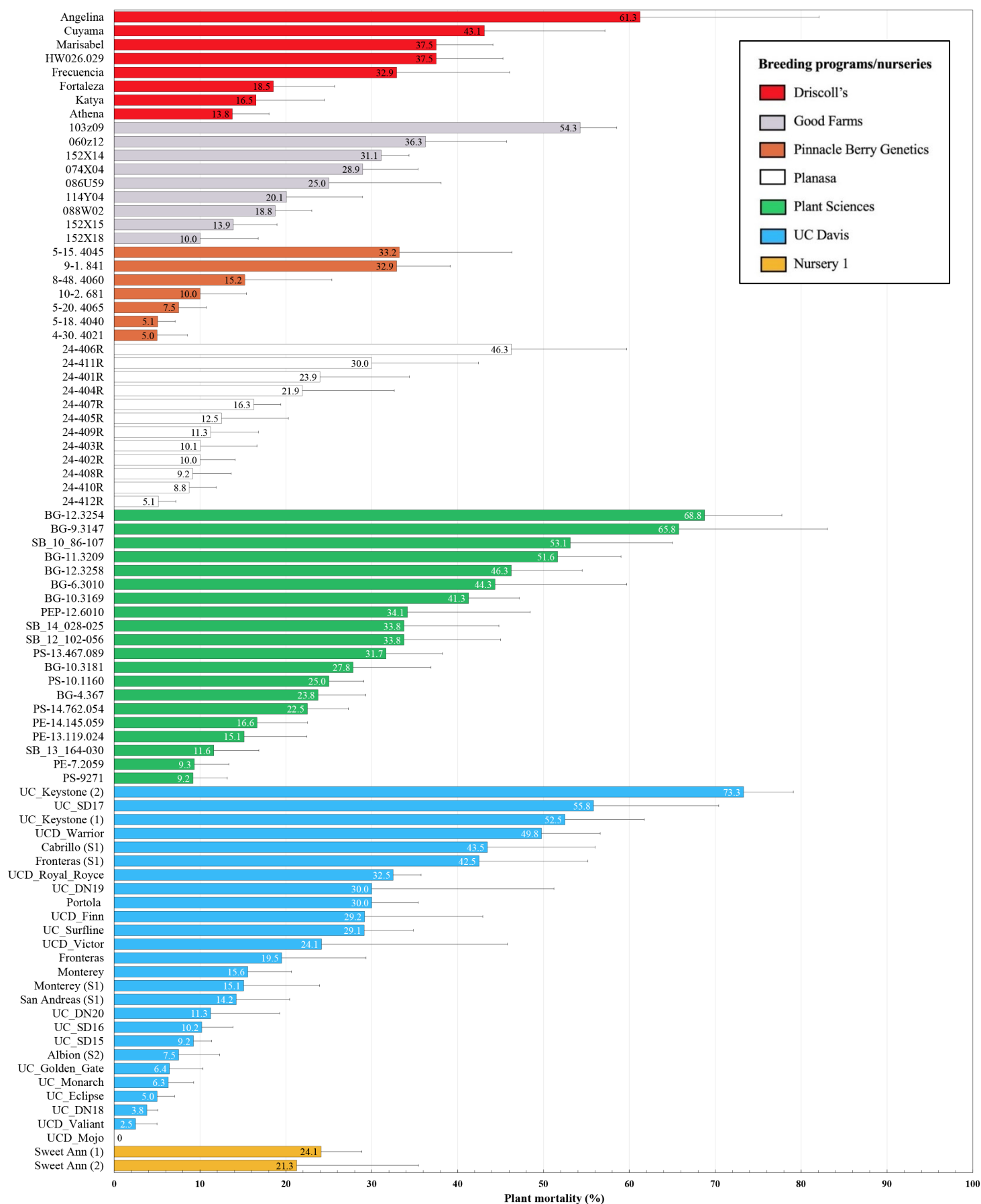


Figure 4. Average percent plant mortality due to *Verticillium* wilt (sorted by breeding program) as of 03 Jul 2025. Error bars represent standard error from four replicates per genotype (n=4). UC_Keystone (1) and UC_Keystone (2), as well as Sweet Ann (1) and Sweet Ann (2), are from the same source but are duplicate entries in the trial. S1 and S2 represent different plant sources/nurseries.



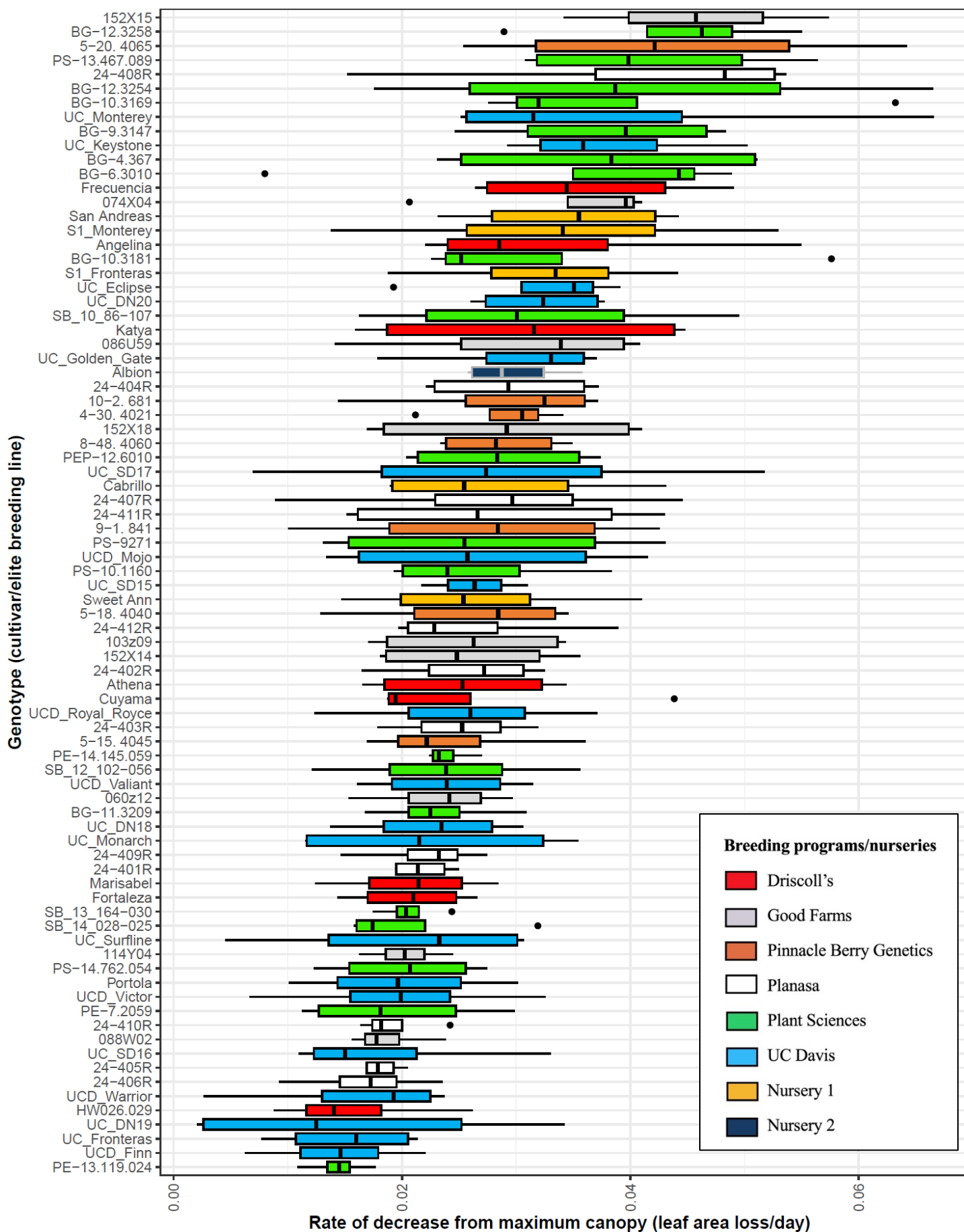


Figure 5. Bar and whisker chart showing the rate of canopy loss using Leaf Area Index (LAI) per day from peak to minimum in the Verticillium trial, up to 27 Jun 2025 (figure by Kaitlin Rim, AerialPlot).

