

## P50 – Grapevine leaf size influences vine canopy temperature

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### Abstract

Grapevine leaves have diverse shapes and sizes. Their shape and size is known to be influenced by genetics, vine phytosanitary status, environment, leaf and vine age, node position on the shoot, shoot order, and other factors. In order to determine the importance of grapevine leaf shape and size to canopy temperature, we examined the relationship in five seedling populations grown in a vineyard in the San Joaquin Valley, California, USA. The seedlings were individual genotypes and unreplicated. All of the populations had one parent or grandparent with compound leaves of the *Vitis piasezkii* type and each population had a different second parent with non-compound leaves. As expected based on published reports and our own observations in related populations, the *V. piasezkii* compound leaf phenotype segregated as a dominant or semi-dominant trait and the populations all showed noticeable segregation for leaf shape. We measured leaf shape using 21 homologous landmarks. We used an infrared thermometer to measure the temperature of the canopy in July and August 2018 and 2019. By recording time of sampling and temperatures, we were able to determine which vines were cooler or hotter than expected, using a linear model. We did not measure canopy architecture, photosynthesis, or water use efficiency, as the heterogeneity of individual seedling canopies is very high, and this substantially complicates these observations on unreplicated seedlings. We established a relationship between leaf size and leaf temperature: vines with larger leaves were cooler than expected. In contrast, leaf shape was not strongly correlated with variation in vine temperature. Ultimately, these findings indicate that vines with larger leaves may contribute to the reduction of overall vine canopy temperature, but further work is needed to determine if this is due to variation in leaf size, differences in the openness of the canopy, or other related traits.

**Keywords:** compound, shape, heat, tolerance, adaptation