

## **Comparisons of Merlot Grapevines Grown on Vertical Trellis Systems**

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A nine-year study (1998-2006) compared the long-term performance of bilateral cordon trained, spur pruned Merlot grapevines trellised to the vertically shoot positioned trellis system (VSP), the vertically divided Smart-Henry trellis system (SH) and the vertically separated Smart-Dyson trellis system (SD). Compared to the VSP, the SH and SD systems reduced canopy density and improved fruit zone microclimate. SD and SH vines had fewer leaf layer numbers and greater amounts of sunlight in their fruiting zones compared to VSP vines. Primary, lateral and total leaf areas per vine were similar among the treatments, indicating that differences in canopy density were a result of canopy division or separation along with an increase in total canopy volume available for foliage distribution. Over the course of the study the yield of SH and SD vines was generally 10% to 15% greater compared to VSP vines. Pruning weight per vine was generally similar for VSP and SD and higher for SH. In the first year of evaluation fruit on downward-oriented shoots on the SH and SD ripened more slowly compared to shoots oriented upward. At harvest few differences in combined fruit (upper and lower canopies) soluble solids, titratable acidity and pH were observed among the treatments over the nine-year period. Fruit and wine color were improved in the SD and SH treatments, and wines from these treatments were preferred over the VSP system. We found that SD and SH trellis systems significantly improved both yield and fruit composition compared to the VSP system. SD is preferred over SH based on ease of establishment and culture, as well as long-term productivity; both vigor and productivity of downward trained shoots in the SH have been lower over the course of the study.