

# GEOMORPHIC CONTROLS ON TEMPERATURE VARIATION IN THE WALLA WALLA AMERICAN VITICULTURAL AREA

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The Walla Walla American Viticultural Area (AVA) straddles the border of eastern Washington and Oregon, encompassing the Walla Walla Valley and flanks of the surrounding uplands. The AVA is bounded to the southwest by the Vansycle Ridge escarpment, to the east by the Blue Mountains, and to the north by the Palouse Hills. Elevations in the Walla Walla AVA range from 150 m along the Walla Walla River in the west to 625 m in the Blue Mountain foothills. Westward narrowing of the Walla Walla Valley towards the confluence of the Walla Walla River with the Columbia River restricts cold air drainage and strongly influences daily high and low temperatures, average temperatures, diurnal temperature variation, and growing degree days (GDD). Temperature data loggers were installed at 35 sites (mostly vineyards) in the Walla Walla AVA to better document the geomorphic controls on variations in these temperature parameters. The data loggers recorded hourly temperatures 1.5 m above the ground during the critical ripening period of early August through early November. Average air temperature and GDD were found to increase with elevation in the Walla Walla AVA, reaching a maximum within a “thermal crescent” in the foothills of the Blue Mountains. Average diurnal temperature variation, which has been shown to influence grape juice chemistry during ripening, was inversely related to elevation. One-third of the sites had temperature parameters that were anomalous for their elevations. Temperatures at these sites appear to be significantly influenced by local relief. Lower temperatures were recorded at sites that are low relative to the average elevation within a 1 km radius of the site. Higher temperatures were recorded at sites that are high relative to the average elevation within a 1 km radius of the site and with proximity to Vansycle Ridge. The higher temperatures near Vansycle Ridge may be associated with adiabatic warming of descending southwesterly winds.