

Effects of Regulated Deficit Irrigation on California North Coast Cabernet Sauvignon

Erica J. Lundquist, Terry L. Prichard,* and Rhonda J. Smith

Department of Land, Air and Water Resources, Cooperative Extension, 420 South Wilson Way, Stockton, CA 95205 [email: tprichard@ucdavis.edu]

In California's North Coast, achieving moderate, consistent vine water deficits is complicated by annual variations in early season rainfall. A four-year irrigation strategy study (1997 to 2000) was conducted in a 1.4 acre Cabernet Sauvignon vineyard, clone 8 on 5C rootstock, at the University of California Hopland Research and Extension Center. A regulated deficit irrigation approach was investigated using leaf water potential levels of -1.2 and -1.4 MPa to trigger the start of irrigation followed by deficit irrigation at 35 or 60% of full potential water use. Additional treatments were 100% full potential water use and a variable deficit irrigation strategy. Leaf water potential in the deficit irrigation treatments dropped below that of the full water treatment before veraison, and leaf water potentials declined more in the treatments receiving less water. Shoot length and pruning weights declined, and light in the fruit zone increased with reduced applied water. Yield reductions in the deficit treatments relative to the full water treatment were 12 to 18% the first year and stabilized at 21 to 37% by the third year of the study. Delays in soluble solids accumulation were observed in the treatments experiencing the most severe water deficits. Titratable acidity and malic acid concentrations were higher in treatments receiving more irrigation water, while irrigation treatment effects on juice pH and potassium concentration varied from year to year. Leaf water potential used as a trigger to initiate irrigation followed by application volumes that were portions of full potential water use gave consistent effects on yield, juice composition, and vegetative growth.

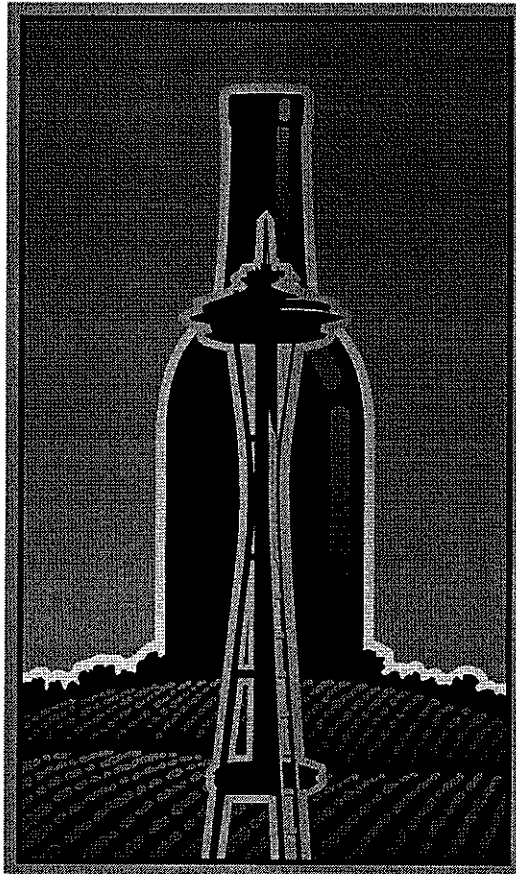
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