Irrigation and related publications by Larry E. Williams


8. Araujo, F., L.E. Williams and M.A. Matthews. 1995. A comparative study of young 'Thompson Seedless' grapevines under drip and furrow irrigation: II. Growth, water use efficiency, and nitrogen partitioning. Scientia Horticulturae 60:251-265. (*There was no difference in water use efficiency (ETc or water used vs. yield) between the drip and furrow irrigated vines*)

9. Williams, L. E. Grape. 1996. In, Plants and Crops: Source-Sink Relationships. E. Zamski and A.A. Schaffer (Eds.), Marcel Dekker, Inc., New York. (*The effects of applied water amounts at various fractions of measured ETc (determined with weighing lysimeter) on reproductive and vegetative biomass accumulation of vines is given*)


17. **Williams, L. E., C. J. Phene, D. W. Grimes, and T. J. Trout.** 2003b. Water use of mature Thompson Seedless grapevines in California. Irrigation Science 22:11-18. *(Vine ETc (determined with lysimeter) and seasonal Kc values given for years 4 to 7 after planting. The Kc values are given as a function of calendar days and degree-days after budbreak)*

18. **Williams, L. E. and J. E. Ayars.** 2005a. Water use of Thompson Seedless grapevines as affected by the application of gibberellic acid (GA3) and trunk girdling – practices to increase berry size. Agricultural and Forest Meteorology 129-85-94. *(Grapevine ETc and Kc are reduced when the vines are girdled at berry set to increase berry size, recovers when it has healed. The Kc remains high through the end of the irrigation season, November 1)*

20. **Williams, L.E.** and J.E. Ayars. 2005b. Grapevine water use and the crop coefficient are linear functions of the shaded area measured beneath the canopy. Agricultural and Forest Meteorology. 132: 201-211. *The seasonal crop coefficient is a linear function of the amount of shade (or fraction of cover) measured beneath the canopy at solar noon.*

21. **Williams, L.E.** and T.J. Trout. 2005. Water relations of field-grown *Vitis vinifera* L. in response to high frequency drip irrigation. American Journal of Enology and Viticulture. 56:357-366. *Non-water stressed values of midday leaf and stem water potential are given. These values can be used to determine if one is irrigating at full ETc.*


24. **Williams, L. E.,** D. W. Grimes and C. J. Phene. 2010a. Effects of applied water at various fractions of measured evapotranspiration on water relations and vegetative growth of Thompson Seedless grapevines. Irrigation Science. 28:221–232. *Applied water amounts were based upon the measurement of ETc with weighing lysimeter.*


26. **Williams, L. E.** 2010. Interaction rootstock and applied water amounts at various fractions of estimated evapotranspiration (ETc) on productivity of Cabernet Sauvignon. Australian Journal of Grape and Wine Research. 16:434-444. *A crop coefficient developed in a VSP trained vineyard on 2.13 m row spacing was adapted for a row spacing of 3.05 m.*

27. **Williams, L. E.,** P. Baeza, and P. Vaughn. 2011. Midday measurements of leaf water potential and stomatal conductance are highly correlated with daily water use of Thompson Seedless grapevines. Irrigation Science. 30:201-212. *Midday leaf water potential (and conductance) decreased linearly as the ET_{ly}/ETo ratio decreased.*

29. **Williams, L.E.** 2012. Interaction of applied water amounts and leaf removal in the fruiting zone on grapevine water relations and productivity of Merlot. Irrigation Science. 30:363-375. *(The seasonal Kc values were derived by measuring the shaded area under the vines across 5 years)*

30. **Williams, L.E.** 2012. Leaf water potentials of sunlit and/or shaded grapevine leaves are sensitive alternatives to stem water potential. Journal International des Sciences de la Vigne et du Vin. 46:207-219. *(Study indicates that stem water potential measurements are no better than leaf water potential, if the latter is measured correctly)*


32. **Williams, L.E.** 2012. Effects of applied water amounts at various fractions of evapotranspiration (ETc) on leaf gas exchange of Thompson Seedless grapevines. Australian Journal of Grape and Wine Research 18:100-108. *(Applied water amounts were based upon measured ETc with a weighing lysimeter)*

33. Iandolino, A.B., R.W. Pearcy and **L.E. Williams.** 2013. Simulating three-dimensional grapevine canopies and modeling their light interception characteristics. Australian Journal of Grape and Wine Research. 19:388-400. *(The YPLANT model simulated the interception of light across the day as a function of row direction, N/S row intercepted the most, E/W row least)*

34. Zarco-Tejada, P.J., V. González-Dugo, **L.E. Williams,** L. Suárez, J.A.J. Berni, D. Goldhamer and E. Fereres. 2013 A PRI-based water stress index combining structural and chlorophyll effects: Assessment using diurnal narrow-band airborne imagery and the CWSI thermal index. Remote Sensing of Environment. 138:38-50. *(Photochemical Reflectance Index (PRI) was highly correlated with other measures of vine water stress to include leaf water potential and CWSI)*

35. **Williams, L.E.** 2014. Determination of evapotranspiration and crop coefficients for a Chardonnay vineyard located in a cool climate. American Journal of Enology and Viticulture. 65:159 – 169. *(Seasonal vineyard ETc and the calculation of the Kc were determined using the water balance technique. The seasonal Kc values were similar to those predicted using the shaded area technique)*

36. **Williams, L.E.** 2014. Effect of applied water amounts at various fractions of evapotranspiration on productivity and water footprint of Chardonnay grapevines. American Journal of Enology and Viticulture. 65:215 – 221. *(Productivity measured with applied water amounts at various fractions of estimated ETc and water footprint calculated)*

vines on a 2.13 m row spacing and adapted for a 1.83 m row spacing and examined the effect of deficit irrigation on N fertilizer use efficiency)

38. Pearsall, K.R., L.E. Williams, S. Castorani, T.M. Bleby and A.J. McElrone. 2014. Evaluating the potential of a novel dual heat-pulse sensor to measure volumetric water use in grapevines under a range of flow conditions. Functional Plant Biology. 41:874-883. (Calculation of vine water use with sap flow sensors was compared to water use of vines in lysimeter)

39. Steenwerth, K.L., E.B. Strong, R.F. Greenhut, L.E. Williams, A. Kendall. 2015. Life cycle greenhouse gas, energy, and water assessment of wine grape production in California. Int. J. Life Cycle Assess. 20:1243-1253. (Calculation of ETc used Kc values from the Paso Robles study (publication 26) and the Carneros study (publication 35))

40. Williams, L.E. and Fidelibus MW. 2016. Measured and estimated water use and crop coefficient of grapevines trained to overhead trellis systems in California’s San Joaquin Valley. Irrig. Sci. 34:431-441. (Vines in the lysimeter were farmed as overhead trellised, Dried on the Vine raisins for the first two years and an open gable type trellis for table grape production for the next two years. Measured values of the seasonal Kc for lysimeter vines were compared to shaded area Kc values from other vineyards)

41. Williams, L.E. 2016. Irrigation scheduling: Use of reference ET (ET0) and crop coefficients (Kc). In: Proceedings of Managing Water in California Vineyards Symposium, 67th ASEV national conference. Monterey, CA. 10 pp. (This provided a summary of how to estimate ETc using Kc values adapted to different trellis types and row spacings)

42. Williams, L.E. 2017. Physiological tools to assess vine water status for use in vineyard irrigation management: Review and update. Acta Hortic 1157:151-166. (This is a review of how to determine when to start irrigating and then how much to apply once that decision has been made)

43. Williams, LE and Heymann H. 2017 Effects of applied water amounts and trellis/training system on grapevine water relations, berry characteristics, productivity and wine composition of Cabernet Sauvignon. Acta Hortic 1150:413-426. (Used Kc values developed for VSP trained vines on a 2.13 m row spacing and adapted for a 1.82 m row spacing and developed the seasonal Kc for the Scott Henry trellis (vertically split canopy) using the shaded area technique)

44. Williams, L.E. 2017. Deficit irrigation of wine grape vineyards. Progressive Crop Consultant, November/December. pp. 8-14. (This provided a summary of how to estimate ETc using Kc values adapted to different trellis types and row spacings and then how to deficit irrigate the vines)