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Understanding the dynamics of citrus water use

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Abstract

The quantification of water use of citrus orchards is important in order to prevent stress developing in the orchard and to avoid wasting precious water resources. Measurement of citrus orchard water use is not possible under all environmental and management combinations because of the expense and time it takes to make the measurements. Models which are able to accurately predict water use are therefore vital in order to provide accurate estimates of citrus water use across different areas in both South Africa and the world. However, to be able to model citrus water use, a thorough understanding of the factors governing citrus tree water use is required. The Water Research Commission solicited a project in 2006 (Project K5/ 1770) to determine the water use of fruit orchards. From measurements performed in a number of orchards across climatic zones in South Africa it is evident that citrus water use, under conditions where soil water is not limiting, is not solely governed by atmospheric demand, and is under greater stomatal control than most other crops. The implication of this is that there is a limit to the amount of water which a citrus tree can transpire on hot, dry days. The important question is whether water use is restricted by stomatal control or by the ability of the plant to transport water to the canopy?