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Assessment of the Irrigation Management and Irrigation Network in the Valdebebas Urban Development (Madrid)

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In temperate climate cities, with frequent long periods of water scarcity, urban parks and gardens require a large supply of water to maintain good ornamental quality. Thus, it will be advisable to assess water efficiency, both in the irrigation management and irrigation network, aimed at avoiding/decreasing water losses and energy waste, and maintaining environmental conditions. This study presents the results of the irrigation systems performance and irrigation management in the urban development Valdebebas (Spain), which contains 18 ha to urban parks irrigated with regenerated waste water, in operation since 2008. Its smart controlled irrigation schedules irrigation events using climatic data from a nearby weather station. Although, this is beneficial for irrigation management, an arbitrary estimation of plant coefficient Kc could affect the water use, resulting in overwatering in most Valdebebas' parks. Consequently, it could yield also to high energy consumption and possible waste of water, and aquifer contamination. The results showed that irrigation management could be improved if a proper plant factor KL is applied instead of Kc. In an irrigation season, the saving water estimations were: 15934 m3 for trees; 23980 m3 for shrubs; 2487 m3 for lawn; and 1810 m3 for flowers. The uniformity of water application in the irrigation systems is low (Christiansen Uniformity coefficient below 80 %) for a drip irrigation method, although it could be improved by reducing the emitter‘s clogging.