Record: 1

Title: An innovative remote sensing based reference evapotranspiration method to support irrigation water management under semi-arid conditions [electronic resource].

Author: Cruz-Blanco, M.; Santos, C.; Lorite, I.J.

Source: Agricultural water management, 2014 Jan. 1, v. 131, p. 135-145. 131

Publisher: Elsevier B.V

Abstract: Reference evapotranspiration (ET_o) is an essential component of irrigation water management due to it being a basic input for estimating crop water requirements. Multiple approaches have been identified for ET_o assessment but most of them are based on daily meteorological data provided by weather station networks that provide an accurate meteorological characterization. A new alternative approach called MA+LSE based on the Makkink-Advection (MAK-Adv) equation in combination with remotely sensed solar radiation and a numerical weather forecast of near surface air temperature has provided good estimates of ET_o under different weather conditions in a semi-arid region located in Southern Spain, without requiring local meteorological data. In order to evaluate the utility of the MA+LSE approach for irrigation water management, some well-known methods for ET_o assessment and the MA+LSE approach were considered for the development of irrigation schedules in ten irrigation schemes located in a semi-arid region in Southern Spain. The impact of the approach considered for ET_o assessment on irrigation scheduling and on simulated yield for a maize crop was determined. Thus, MA+LSE and Hargreaves methods generated similar irrigation schedules and estimated yield to those determined by using ET_o from the Penman–Monteith (PM-FAO56) approach. Thus, average seasonal irrigation volume estimated by MA+LSE was underestimated by around 2.6%, causing a yield reduction of 2.2% compared with the irrigation scheduling based on PM-FAO56. These results confirm the applicability of the MA+LSE approach, especially in areas where meteorological data are missing or inaccurate, obtaining a similar performance for irrigation water management to that of other approaches with high data requirements such as PM-FAO56.

Descriptors: remote sensing; meteorological data; semiarid zones; water requirement; solar radiation; crop yield; air temperature; evapotranspiration; irrigation scheduling; irrigation rates; Spain

Genre: Internet resource

Language: English

Publication Type: Journal Article

ISSN: 03783774

URL: http://dx.doi.org.proxy.lib.pdx.edu/10.1016/j.agwat.2013.09.017

Subset: Indexing Branch - NAL

Publication Date: Jan 1, 2014

Update Code: 00000000

Accession Number: IND500706624

Database: Agricola