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**To:** Agriculture Water Use Efficiency  
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**Subject:** Spatial variability of crop ET

AgWUE,

Attached are a reference and accompanying summary of an article dealing with spatial variability of  $ET_c$  and including a comparison with the two-step  $ET \times K_c$  method. It is apparent that energy balance methods are now widely employed. A link to a paper from Colorado is also included.

“Using remote sensing to evaluate the spatial variability of evapotranspiration and crop coefficient in the lower Rio Grande Valley, New Mexico

[Zohrab Samani](#), [A. Salim Bawazir](#), [Max Bleiweiss](#), [Rhonda Skaggs](#), [John Longworth](#), [Vien D. Tran](#) and [Aldo Pinon](#)

From the issue entitled "Special Issue: Evapotranspiration Measurement and Modeling; Guest Editor: Samuel Ortega-Farias"

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Editor's introduction:

Samani, Bawazir, Bleiweiss, Skaggs, Longworth, Tran, and Pinon (*Using Remote Sensing to Evaluate the Spatial Variability of Evapotranspiration and Crop Coefficient in the Lower Rio Grande Valley, New Mexico*) study the spatial and temporal variability of  $K_c$  and evapotranspiration for pecan orchards using remote sensing information from Landsat-5 and Landsat-7, combined with ground-level measurements, on a field scale in the Lower Rio Grande Valley (LRGV) in New Mexico. The Regional ET Estimation Model (REEM) applied in this study shares the surface energy balance approach of the Surface Energy Balance Algorithm for Land (SEBAL) and Mapping Evapotranspiration at High Resolution (METRIC™) models. The findings in this paper reveal that LRGV consumptive use for pecan varies widely over the region.

Summary

Pecan is a major crop in the lower Rio Grande Valley (LRGV), New Mexico. Currently, about 11,000 ha of pecan orchards at various stages of growth are consuming about 40% of irrigation water in the area. Pecan evapotranspiration (ET) varies with age, canopy cover, soil type and method of water management. There is a need for better quantification of pecan ET for the purpose of water rights adjudication, watershed management and agronomical practices. This paper describes a process where remote sensing information from Landsat-5 and Landsat-7 were combined with ground level measurements to estimate pecan ET and field scale actual crop coefficient ( $K_c$ ) for the LRGV. The results showed that annual pecan water use for 279 fields ranged from 498 to 1,259 mm with an average water use of 1,054 mm. For fields with NDVI > 0.6 (normalized difference vegetation index), which represented mature orchards (total of 232 fields), the annual water use ranged from 771 to 1,259 mm with an average water use of 1,077 mm. The results from remote sensing model compared reasonably well with ground level ET values determined by an eddy covariance system in a mature pecan orchard with an average error of 4% and the standard error of estimate (SEE) ranging from 0.91 to 1.06 mm/day. A small fraction (5%) of the pecan fields were within the range of maximum ET and  $K_c$ .”

Colorado link: [http://ascelibrary.org/iro/resource/1/jidedh/v137/i1/p17\\_s1?isAuthorized=no](http://ascelibrary.org/iro/resource/1/jidedh/v137/i1/p17_s1?isAuthorized=no)

Regards,  
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