

Ground-based Remote Sensing of Corn Evapotranspiration under Limited Irrigation Practices

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Abstract. Ground-based remotely sensed data were used in two major approaches to estimate crop coefficient and evapotranspiration (ET) over two treatments of limited-irrigation corn in northeastern Colorado. The first approach, known as the reflectance-based crop coefficient, takes advantage of the unique relationship between crop coefficients (K_c) and vegetation indices of agricultural crops. The second approach is more complex and approximates the latent heat flux over a crop canopy as the residual of the surface energy balance equation. Implemented methods resulted in crop coefficients similar to what is expected for corn in the semi-arid climate of northeastern Colorado, with basal crop coefficients being lower than the single K_c . Crop coefficient estimates were then used to calculate corn water consumption over a 4-week period. Total corn transpiration ranged from 135 to 169 mm, while total corn ET varied between 163 to 200 mm, for all of the methods and treatments.

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