Simulating water use of irrigated corn on the Texas High Plains. (A03-gerik161501-Poster)

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Abstract:

The crop water supply is the principle factor driving yield in the U.S. Southern Great Plains. Crop simulation models rely on the calculation of potential evaporation of water (PET) to predict the crop water balance. Several PET equations have been developed, but which equation works best within the framework of a crop model is unknown. We compared the measured yield and seasonal crop water use (e.g., from planting to harvest) of irrigated corn (Zea mays L.) grown in weighing lysimeters at Bushland, TX over 3-years (1989, 1990, and 1994) to the yields and seasonal crop water use predicted with the Environmental Policy Integrated Climate model (EPIC) using the Penman, Penman-Monteith, Priestly Taylor, and Hargreaves PET equations. The mean measured yield and crop water use were 9.7 MT and 785 mm with a SE of 0.9 MT and 53 mm, respectively. Predicted yield and seasonal crop water use with the EPIC model and the four PET equations did not statistically differ from the measured values. These findings suggest that the selection of the PET equation in crop simulation model may not be critically important.

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