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WATER IRRIGATION SCHEDULER FOR EFFICIENT APPLICATION (WISE)

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ABSTRACT

WISE is a user-friendly, cloud-based app that aids in irrigation scheduling for field crops in Colorado. The user is given a daily estimate of the root zone soil water deficit (D, net irrigation requirement) through a Web interface or smartphone Apps. Once a user sets up a field using the Web-based tool, WISE automatically downloads field-specific soil properties and daily weather data [crop evapotranspiration (ETc) using crop coefficients, rainfall] from the nearest automatic weather station(s) to estimate the daily water balance of the soil root zone. The user needs to input actual gross irrigation amounts to get accurate estimates of D from the WISE water balance model. WISE was shown to adequately estimate water requirements for irrigation scheduling based on comparisons of WISE-calculated and field-measured D values. Example applications of WISE in Colorado for tactical irrigation scheduling, estimation of actual ETc, and exploration of the feasibility of variable rate irrigation (VRI) are described. Opportunities for assimilating sensor data into the WISE soil water balance model are also discussed.