



Innovative Research and Technology for Precision Irrigation

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Message from the Guest Editor

Precision agricultural irrigation often conserves water and contributes to production. However, surface or near-surface precision irrigation systems require new innovative technologies designed to uniformly redistribute additional non-gravitational water in plant root zones that elevate root water uptake efficiencies (RWUEs). Non-uniform root-zone soil water coupled with heterogenous nutrient distributions are major deficiencies associated with precision irrigation. The best soil–plant atmosphere monitoring models coupled with soil water meters and aerial multi-spectral monitoring devices digitally controlling initiation, termination, and rates of precision irrigation fail to avoid multiple plant water deficits. Therefore, new innovative technologies designed to more uniformly distribute soil water, nutrients, and oxygen in plant root zones and determine water and nutrient deficits earlier during multiple crop growth stages are needed before precision irrigation can significantly expand production and improve water and nutrient conservation while protecting the environment.

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