



## Comparison of Different Model-Based Deficit Irrigation Strategies to Maximize Water Productivity of Corn

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The pursuit for a viable and sustainable agriculture to meet the food demands of a growing world population has lead to a renewed interest in water saving techniques such as controlled deficit irrigation. Goal in this investigation was the maximization of water productivity (WP) of corn (variety Pioneer PR36K67) grown in containers in a greenhouse that were subjected to different water and nitrogen treatments. The treatments for water were full irrigation, a single constant tension threshold throughout the whole growing period, four different tension thresholds concurring with the development stage of the plant, and application of a total amount of water for the whole growing period according to a fixed irrigation schedule. All tension threshold levels as well as the irrigation schedule were obtained prior to the experimental run by the simulation based optimization framework OCCASION. Resulting tension threshold levels lay well beyond the measurement range of ordinary tensiometers (greater than 800hPa). Therefore a new sensor called pF-Meters for monitoring soil tension and tension-based irrigation control was implemented. The results demonstrate that OCCASION can be successfully utilized to derive the best management practice for obtaining the highest water productivity for tension based as well as scheduled based deficit irrigation strategies compared to a full irrigation treatment.