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Surface water and groundwater interactions in semiarid irrigated floodplains of northern New Mexico

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Deep percolation from irrigation can provide a significant amount of aquifer recharge in alluvial floodplains. A better understanding of surface water and groundwater interactions in irrigated floodplains is needed for properly assessing the mechanisms of water transport through the vadose zone and for estimating potential aquifer recharge from deep percolation in these systems. Primarily based at the NMSU-Alcalde Science Center in Alcalde, NM, we are conducting a study aimed to quantify different components of the water budget in different crop fields with alluvial soils. We are conducting several studies on different crops (alfalfa, grass hay, strawberry, and jujube) with different irrigation techniques (flood, sprinkler, and drip) to characterize changes in soil water storage, water movement through the vadose zone, and shallow groundwater level rise in response to deep percolation from irrigation. We have instrumented these crop fields to measure total amount of water applied, changes in soil moisture, and drainage below the root zone. In addition, we have installed and instrumented different monitoring wells to track water table fluctuations in response to irrigation deep percolation. Climate data from nearby, previously installed, weather stations is being used to calculate evapotranspiration. Preliminary results show a relatively rapid movement of water through the upper 50 cm of the vadose zone for crops irrigated under flood and under sprinkler conditions. Results from this study can contribute to the better understanding of the surface water and groundwater interactions in floodplain irrigated valleys of northern New Mexico under different irrigation techniques.