

Preliminary Results of Detailed Field Measurements of On-Farm Water Management in the Lower Arkansas River Basin in Colorado

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Abstract. Lessons learned during the field activities in 2004, within the Colorado's Lower Arkansas Valley series of studies conducted by CSU, taught us the level of detail necessary for implementing a close-monitoring scheme for on-farm water management study towards modeling. In 2004, fifteen fields under sprinkler, drip and surface systems were evaluated for ongoing water use practices with the scope of devising potential improvement. At that time, measurements of total irrigation water inflow and outflow were made and some field measurements were carried out for characterization of irrigation and soil properties such as infiltration tests and irrigation water quality. During 2005, besides those measurements, a more wide-ranging and detailed set of data was collected for modeling purposes and on-farm irrigation practices were noted particularly in surface irrigation systems which make up the greater percentage of irrigated farms in the region. This particular sub-project aims at the comprehensive study of the inter-connected relationships of plant-soil-water, their spatial and temporal variation within the study sites; calibration and validation of the computer-based numerical model CSUID will be conducted using the data generated in this study. CSUID is a computer-based Decision Support System for the design and management of conjunctive irrigation and drainage systems. The approach taken includes a combination of fieldwork, laboratory experiments, data analysis and computer modeling. Ultimately, the field data and the refinement of the model will provide tools to allow key decision-makers to develop alternatives that will allow these problems to be mitigated and will give insights for the solution of such problems in the long term. Although the data for the study is particularly for the Lower Arkansas River Valley, it is anticipated that once the data is processed and analyzed and the model is calibrated and verified, it will be suitable to be used in other irrigated areas of the world.

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