

## **Improving Irrigation System Performance through Scheduled Water Delivery in the Middle Rio Grande Conservancy District.**

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**Abstract.** The Rio Grande is one of the few large rivers in the American Southwest and supports a diverse set of ecosystems as well as urban, industrial, interstate, and agricultural demands. Competition for this limited water resource has increased tremendously during the last decade and many complex issues have arisen as environmental concerns warrant a larger portion of available water. Irrigation water has historically been delivered using an on demand system. This delivery method does not require metered water use and therefore water rights for agriculture in the Middle Rio Grande Valley are not defined. Scheduled water delivery (SWD) provides the opportunity to increase overall irrigation system performance and determine legitimate water use without adjudication. In SWD, lateral canals receive water from the main canal according to their need for water, allowing water use in some laterals while others are closed. A well-managed program of SWD is able to fulfill seasonal crop water requirements in a timely manner, but requires less water than on demand water delivery. In order to successfully realize SWD in an irrigation district several components need to be addressed and developed simultaneously. The first component is the development of a Decision Support System (DSS) that can perform the myriad of calculations necessary to determine an optimal irrigation schedule for an entire irrigation district. A DSS developed over the last four years uses linear programming to find an optimum water delivery schedule for canal service areas in the Middle Rio Grande Conservancy District (MRGCD) irrigation system. The DSS has been developed for all four division of the MRGCD and a significant validation effort of input parameters and model logic has been completed. The second component in achieving scheduled water delivery is a program of irrigation infrastructure modernization with Supervisory Control and Data Acquisition (SCADA) incorporation. The aging canal infrastructure of the MRGCD did not lend itself to accurate water measurement and distribution. Over the past six years, the MRGCD has modernized the canal infrastructure and developed a SCADA system with the focus being to improve water use efficiency. With structural modernization and SCADA, the irrigation system currently lends itself to the implementation of water delivery scheduling. The third component in achieving scheduled water delivery is implementation. Implementation hinges on gaining public acceptance and on training and support. To gain acceptance and disseminate information regarding SWD public outreach meetings, newsletters, websites, and ditch-rider/water master training have been completed. Through this effort public acceptance and political support of SWD have been gained. Additionally, the MRGCD has taken ownership of the DSS and started using it independently. This presentation will describe the three components of scheduled water delivery in the MRGCD and the progress towards improving irrigation system performance using a multifaceted approach.

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