

Quantity and Quality of Storm water Runoff in Dryland Agroecosystems

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Abstract. Water is important and limiting factor for dryland agroecosystems in eastern Colorado. Land management practices affect the capture, storage, and utilization of water. For example, soil tillage practices, crop rotation, and weed control are land management practices that affect the capture and storage of precipitation. These practices also influence the transport of agricultural contaminants in overland flow, which in turn affect the quality of receiving waters. No-till cropping practices increase the efficiency of precipitation storage in soil compared to conventional tillage by decreasing evaporation, increasing infiltration, and reducing runoff. However, even in intensive no-till systems only about 40% of precipitation during fallow periods is stored. Further improvements in water use efficiency require a detailed understanding of the hydrologic cycle in these agroecosystems. The importance of runoff losses during high intensity rain events and associated contaminant transport in dryland agroecosystems is not well documented. The objectives of this study are to quantify amounts of storm water runoff and associated contaminant transport in dryland agroecosystems and to model these results in order to make predictions for alternative cropping approaches. Field plots were set up in Sterling and Stratton, CO in Wheat-Corn-Fallow (WCF), Wheat-Corn-Millet (WCM), and Grass (G) rotations. Precipitation, storm water runoff, and runoff water quality will be measured and compared for different management scenarios as well as used to calibrate prediction models for alternative practices.