



Soil Moisture Response to Tree Thinning in Central New Mexico

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In semi-arid regions of the western U.S. there is heightened interest in tree control to increase water availability for other uses such as forage growth and groundwater recharge. This study in central New Mexico was conducted to determine if herbicide treatment of juniper trees and reduced tree water demands would increase water availability. Three grazing exclosures with treated and untreated trees were instrumented with recording soil moisture probes under (both live and dead) trees and in interspaces between trees. For all treated plots compared to control plots there was greater herbaceous vegetation production (386 kg ha⁻¹ treated, 108 kg ha⁻¹ control) and lower soil moisture as volumetric water content (16.6 % treated, 20.5 % control). Absolute maximum temperature was lowest (25.3 °C) under live trees, intermediate (26.0 °C) under dead trees, and highest (27.2 °C) in interspaces. Similarly, treated interspace plots had more herbaceous vegetation than untreated interspace plots. However, interspace plots combined had higher soil moisture than under tree plots. Only during four unusually wet months during the 2.5 year study was there enough excess soil moisture (beyond surface vegetation needs) to wet the deepest soils. In this setting, most water gained by tree removal is likely consumed by increased herbaceous vegetation.

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