343-1 Tillage Intensity and Residue Effects on Early Season Evaporation and Yield in Mung Bean.

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Early season evaporation losses from irrigated crops can significantly reduce water productivity. A field experiment was carried out at the Central Experiment Station of Uzbekistan's National Cotton Growing Research Institute (41.42 N, 69.49 E) on a silt loam soil with irrigated mung bean (*Vigna radiata (L.) R. Wilczek*) grown as a summer crop. The effects of tillage and residue amount on soil water evaporation, evapotranspiration (ET), and mung bean yield were evaluated using a randomized complete block design. Daily evaporation (*E*) was monitored using microlysimetry for 30 days after planting to compare *E* between permanent beds (PB) with limited reshaping and conventional tillage (CT), each with 25%, 50% and 100% residue retention on a mass basis. Microlysimeters were 30-cm deep by 8-cm diameter rigid polyvinyl chloride pipe capped on the bottom with 8-cm diameter metal discs. Four microlysimeter soil cores were acquired from each of three replicate plots, weighed each morning and evening, and replaced after five days. Field soil water contents were measured weekly using a neutron probe from 0.10 to 1.50 m depth at 0.20-m intervals. Evapotranspiration (ET) throughout the growing season was estimated as the change in stored soil water plus measured precipitation and irrigation with the assumption of negligible runoff and drainage beyond 1.5 m. One week after planting, soil water evaporation rates under CT were significantly greater than for PB (P=0.04). Following 30 days after planting, however, cumulative evaporation averaged 60 mm for all treatments and was not influenced by tillage. Soil water evaporation declined with increasing residue amounts, but these effects were not significant (P=0.25). Dry mung bean yield was not influenced by residue amount (P=0.64) and was only 0.12 Mg ha^{-1} greater under CT compared with PB (P=0.058). Under the conditions of this study, reduced tillage practices that retain greater surface residue did not significantly reduce soil water evaporation and consequently did not increase the yield of irrigated mung bean.

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