

**CONSERVATION TILLAGE AND WATER MANAGEMENT
II: THE EFFECT OF DECREASED IRRIGATION ON CROP YIELD AND
PROFITABILITY IN CONSERVATION TILLAGE SYSTEMS**

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ABSTRACT

The interaction between reduced irrigation capacity and tillage, including the possible conservation of water with reduced tillage, is of vital interest to growers. A field study was initiated in 2002 to determine crop response under a simulated reduction in irrigation. Three tillage systems were replicated three times each in one of four irrigation levels (100% of a recommended amount, 66%, 33%, and 0% or dryland). Irrigation was based on the Irrigator Pro software model for each crop. Tillage systems were conventional tillage, wide-strip tillage, and narrow-strip tillage. Beginning in 2005, the narrow-strip tillage treatments were converted to a strict no-till system. The test area was planted in triplicate, in a peanut-cotton-corn rotation, with each crop being present each year. Yield of all three crops was highly dependent on seasonal rainfall and degree day accumulation; however, peanut yield was equivalent to the 100% treatment with one-third less irrigation applied in three of four years, regardless of tillage treatment. Corn yield was equal to the 100% level with one-third less water in one season, and two-thirds less in 2004. Cotton yields were equivalent regardless of irrigation treatment or year. All crops responded positively to conservation tillage, with corn yielding a 36 bushel/acre average increase for either type of conservation tillage system versus conventional. Peanut and cotton yielded greater under conservation systems, though not always significant for that year. All crops yielded significantly greater under conservation tillage systems in the 0% (dryland) irrigation system, suggesting that non-irrigated farms may see the most benefit from conservation tillage practices. Net returns, an indicator of farm profitability, were positive each year only in the conservation tillage treatments, regardless of irrigation.