

1294 Utilizing subsurface drip irrigation and conservation tillage in cotton production systems in the Texas rolling plains

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Ground water resources are limited in the Texas Rolling Plains. With Cotton Foundation support, a 3-yr subsurface drip irrigation (SDI) study was initiated in Knox County in 2003. In one study, treatments included production on 40-inch and 80-inch drip tape spacing and 100% evapotranspiration (ET) replacement, furrow irrigation, and no-till in a terminated rye cover crop. In a second study, treatments included irrigation at 100% ET replacement without a rye cover crop, 50% ET replacement with and without a rye cover crop, and furrow irrigation. SDI significantly increased cotton yield over that from furrow irrigation 2 of 3 years, from 250 to 575 lb/ac. Excess rainfall in 2005 resulted in no significant differences among treatments. Loan values varied among treatments, but favored SDI-grown cotton 2 of the 3 yr. In 2003, a 50% reduction in ET replacement reduced lint yield only 18%. In 2004, there was no reduction in yield with 50% ET replacement compared with the 100% ET replacement. It appears that 100% ET replacement is not necessary to maximize yield under SDI.