

## Yield Comparisons of Subsurface Drip Irrigation to Center Pivot Irrigation in a Farm Scale Environment

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**Objective:** To compare lint yields and irrigation quantities from farm scale cotton production irrigated by subsurface drip irrigation (SDI) and LEPA.



**Methodology:** Interest in subsurface drip continues to grow as water availability decreases and opportunities for cost share assistance for water conserving irrigation equipment becomes available. The question of cotton production using SDI versus pivot is often asked. The Helms Research Farm at Halfway provides a unique, controlled environment to help answer this question. Problems not normally encountered in small plot research including limited irrigation water, inconsistent soils, and challenging topography had to be addressed while irrigating 71 acres with SDI and 103 acres with LEPA during the 2003 growing season. Details of SDI and LEPA irrigated cotton experiments are contained in the following reports. This report contains average cotton yields and irrigation amounts from areas irrigated by these two systems.

**Results:** The 2003 crop year was atypical. The lack of early season rainfall and the typical high winds and low humidity at planting caused problems with cotton germination in SDI areas. The month of June brought 6.55 inches of rain, along with hail, blowing sand and cool weather. Most producers in the area replanted to alternative crops. Drought followed with no measurable precipitation for 60 days from 29 June until 29 August. The fall, however, was very favorable for cotton production with twice the normal heat unit accumulation in October and first frost date in late November.

Considering the adverse weather, overall cotton yields were very high. SDI cotton yields in 2003 averaged 1086 lb/ac using 14.9 inches of irrigation compared to LEPA yields of 1084 lb/ac using an average of 12.86 inches. Drip yields from various experiments ranged from 1000 to 2000 lb/acre. The lack of rains in April and May in both 2002 and 2003 contributed to poor germination of SDI fields causing crop development delays while requiring more irrigation water to establish a stand. Work will continue to improve efficiencies with both SDI and LEPA systems.

Average lint yield and irrigation water used on pivot and subsurface drip irrigated areas at the Helms Farm, 2002.

	2002		2003	
	Pivot (LEPA)	Subsurface Drip	Pivot (LEPA)	Subsurface Drip
Area (acres)	83.64	70.75	102.89	70.75
Irrigation volume used (ac-inches)	1314	1307	1323	1061
Average total irrigation (inches)	15.71	18.47	12.86	14.95
Lint sold (lbs)	101,154	79,746	111,533	76,866
Average yield (lbs/acre)	1209	1127	1084	1086