

Cotton Irrigation Management with SDI (Field 2)

James P. Bordovsky, Joe Mustian, and Megha Parajulee

Objective: To evaluate cotton production resulting from two management scenarios: 1) *High Input* which focuses resources on limited areas to achieve maximum lint yield and 2) *Normal Input* which distributes resources over a wider area to achieve more sustainable yields.



Figure 1. Cotton SDI management study, Helm Farm, October 2003.

Methodology: Cotton was planted in a field where a ten-zone SDI system was installed. Irrigations were applied in alternate furrows of 30-inch rows with each zone 1300 ft by 16 rows wide and independently controlled and metered. Two cotton management strategies were compared. A *High Input*, high-yield management scenario with the production goal of 3.5 bales per acre and no restriction on input level was replicated in four plots. In 2003, the Fibermax 989BGR variety received 10.5 inches of seasonal irrigation, 46 lbs. N/ac in daily seasonal drip irrigations, 10 oz. Pix +/ac in one directed spray application, and weekly scouting for insect pest control controlled at low

thresholds. The *Normal Input* scenario, with an annual yield goal of 2.5 bales per acre, was also replicated four times. Paymaster 2326RR cotton variety was seasonally irrigated with 5.3 inches of water, 18 lbs of N/ac was injected with irrigations, and insects controlled at normal thresholds. Two additional plots were treated as dryland production.

Results: For the past two years, the *High Input* treatment produced significantly higher lint yield, loan values, and seasonal irrigation water use efficiencies than the *Normal Input* treatment. The lint yields were increased by over 400 lb/ac, loan values increase by at least \$0.02/lb of lint, and WUE increased by >10lb lint/ac-in in *High* versus *Normal Input* treatments in both years. Based on this data, installing a portion of a field in SDI and providing full production resources to achieve maximum yield in that area not only reduces initial SDI costs, but, also, increases gross returns per total area compared to installing SDI and stretching limited resources over the larger area. Production over multiple years is needed for valid economic comparisons.

Comparison of cotton lint yield, loan values, and water use efficiency from *Normal* and *High Input* treatments irrigated by SDI in 2002 and 2003.

	2002 Crop Year			2003 Crop Year		
	<i>Normal Input</i>	<i>High Input</i>	Difference	<i>Normal Input</i>	<i>High Input</i>	Difference
Yield (lb lint/ac)						
Hand Harvest	1055 b	1566 a	511	1015 b	1419 a	404
Machine Harvest	1019 b	1433 a	414			
Loan Values (\$/ac)	0.443 b	0.482 a	0.039	0.519 b	0.538 a	0.019
Gross Value @ Loan (\$/ac)	451	691	240	527	763	236
Seasonal Irr. WUE (lb lint/ac-in)	60.8 b	71.4 a	10.6	82.5 b	105.4 a	22.9

* Means followed by the same letter in the same row for a given year are significantly different (P<0.05, Duncan)