



Replicated Drag Hose vs Sprinkler Irrigation Cotton Research Trial - 2012

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Gaines County

Summary Significant differences were observed for most of the yield, economic, and one of the HVI fiber quality parameters measured. After adding lint and seed value, and subtracting ginning, seed and technology fee costs, the net value/acre for the drag hose plots was \$794.64, and \$704.06 for the sprinkler plots, a difference of \$90.58. Micronaire values were 4.8 for drag hose plots and 4.6 for the sprinkler irrigation plots.

Objective The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of cotton under drag hose and sprinkler irrigation in Gaines County.

Materials and Methods

Variety: Deltapine 1044B2RF

Treatments: Sprinkler irrigation vs Drag Hose Irrigation (Sprinkler irrigation was utilized early season to get uniform stand establishment throughout the entire trial. Drag hoses were installed on 25-May on the drag hose plots).

Experimental design: 3 replications

Seeding rate: 3.5 seeds/row-ft in 40-inch row spacing

Plot size: 4 rows by variable length of field (188ft to 606ft long)

Planting date: 14-May

Soil Texture: Sandy

Irrigation: This trial received approximately 8.21 inches of irrigation and rainfall throughout the growing season.

Harvest: Plots were harvested on 11-October using a commercial stripper harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin Turnout: Grab samples were taken by plot and ginned at the Texas A&M AgriLife Research and Extension Center at Lubbock to determine gin turnovers.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and seed values: Ginning costs were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$250/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (3.5 seed/row-ft) for the 40 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed12.xls>

Results and Discussion

Significant differences were observed for most of the yield, economic, and one of the HVI fiber quality parameters measured (Tables 1 and 2). Bur cotton yields averaged 3942 lb/acre with the drag hose plots making 4167 lb/acre, and the sprinkler plots making 3717 lb/acre. Lint yield was 1375 lb/acre for the drag hose plots, and 1224 lb/acre for the sprinkler plots. Seed yield for the drag hose plots was 1999 lb/acre, and the sprinkler plots were 1809 lb/acre. After adding lint and seed value, total value/acre for the drag hose plots was \$982.28, and \$878.19 for the sprinkler plots. When subtracting ginning, seed and technology fee costs, the net value/acre for the drag hose plots was \$794.64, and \$704.06 for the sprinkler plots, a difference of \$90.58. Micronaire values were 4.8 for drag hose plots and 4.6 for the sprinkler irrigation plots.

Conclusions

These data indicate that differences can be obtained in terms of net value/acre when comparing sprinkler irrigation to drag hose irrigation. During the 2012 growing season Gaines County experienced high temperatures and very little rainfall. Additional multi-site and multi-year applied research is needed to evaluate irrigation types across a series of environments.

Acknowledgements

Appreciation is expressed to Shelby Elam Farms for the use of his land, equipment and labor for this demonstration.

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Table 1. Harvest results from the Drag Hose Vs Sprinkler Irrigation, Shelby Elam Farm, Seminole, TX, 2012.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		----- lb/acre -----			\$/lb			----- \$/acre -----			
Drag Hose	33.0	48.0	4167	1375	1999	0.5325	732.38	249.90	982.28	125.00	62.63	794.64 a
Sprinkler	32.9	48.7	3717	1224	1809	0.5328	652.11	226.08	878.19	111.50	62.63	704.06 b
Test average	33.0	48.3	3942	1300	1904	0.5327	692.25	237.99	930.23	118.25	62.63	749.35
CV, %	1.5	1.9	3.3	3.3	3.2	3.1	3.3	3.2	3.2	3.3	--	3.5
OSL	0.8259	0.4581	0.0503†	0.0492	0.0617†	0.9825	0.0491	0.0617†	0.0518†	0.0503†	--	0.0521†
LSD	NS	NS	307	150	145	NS	79.45	18.13	72.04	9.19	--	62.85

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, †indicates significance at the 0.10 level, NS - not significant.

Note: some columns may not add up due to rounding error.

Assumes:

\$3.00/cwt ginning cost.

\$250/ton for seed.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the Drag Hose Vs Sprinkler Irrigation, Shelby Elam Farm, Seminole, TX, 2012.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Drag Hose	4.8	33.5	80.6	28.4	8.0	1.7	78.2	9.0	2.0	1.0
Sprinkler	4.6	33.7	80.6	28.6	8.3	1.7	78.0	8.9	2.7	1.0
Test average	4.7	33.6	80.6	28.5	8.2	1.7	78.1	9.0	2.3	1.0
CV, %	1.5	1.0	2.3	2.4	13.6	42.4	0.2	1.2	--	--
OSL	0.0742†	0.5286	1.0000	0.7586	0.7483	1.0000	0.3701	0.5286	--	--
LSD	0.2	NS	NS	NS	NS	NS	NS	NS	--	--

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LSD - least significant difference at the 0.05 level, †indicates significance at the 0.10 level, NS - not significant