Replicated Cotton Seeding Rate Demonstration
Texas AgriLife Extension Service
Gaines County
Cooperator: Weldon Shook
Manda Anderson, Extension Agent - IPM
Dr. Mark Kelley, Extension Program Specialists II - Cotton
Dr. Randy Boman, Extension Agronomist - Cotton

Summary Significant differences were observed for some yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint yields ranged from a high of 1250 lb/acre for 3 seed/ft to a low of 1158 lb/acre for 2 seed/ft. Lint loan values ranged from a low of $0.5507/lb (All-Tex 65207B2RF) to a high of $0.5738/lb (FiberMax 9170B2F). Seed yield ranged from a high of 1812 lb/acre for 3 seed/ft to a low of 1680 lb/acre for 2 seed/ft. After adding lint and seed value, total value/acre for seed rates ranged from a low of $796 for 2 seed/ft to a high of $864 for 2 seed/ft. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $705 (3 seed/ft) to a low of $660 (3.5 seed/ft), a difference of $45.31. These data indicate that substantial differences can be obtained in terms of net value/acre due to seeding rate.

Objective The objective of this project was to compare yields, gin turnout, fiber quality, and economic returns of four seeding rates under irrigated production in Gaines County.

Materials and Methods

Varieties:	FiberMax 1740B2F
Seeding Rates:	2 seed/row-ft; 2.5 seed/row-ft; 3 seed/row-ft; 3.5 seed/row-ft
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	40-inch row spacing
Plot size:	6 rows by variable length of field (465ft to 722ft long)
Planting date:	17-May

Soil Texture: 91% sand and 9% clay

Soil pH: 7.3

Irrigation: This location was under a LESA center pivot. This trial received approximately 18.42 inches of irrigation and rainfall from 17-May to 4-November.

Date	Inches of Irrigation/Rainfall
6-May to 10-June	2.93
11-June to 15-July	6.98
16-July to 27-August	4.21
28-August to 4-November	4.3

Insecticides/ Nematicides: Temik 15G was applied infurrow at planting at a rate of 5 lb/acre.

Harvest: Plots were harvested on 4-November using a commercial picker 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 AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

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 $175/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate for the 40 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: http://www.plainscotton.org/Seed/PCGseed10.xls

Results and Discussion

Significant differences were observed for some yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout and Seed turnout averaged 36 and 52.4, respectively. Lint yields ranged from a high of 1250 lb/acre for 3 seed/ft to a low of 1158 lb/acre for 2 seed/ft. Lint loan values ranged from a low of $0.5507/lb (All-Tex 65207B2RF) to a

high of $0.5738/lb (FiberMax 9170B2F). Seed yield ranged from a high of 1812 lb/acre for 3 seed/ft to a low of 1680 lb/acre for 2 seed/ft. After adding lint and seed value, total value/acre for seed rates ranged from a low of $796 for 2 seed/ft to a high of $864 for 2 seed/ft. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $705 (3 seed/ft) to a low of $660 (3.5 seed/ft), a difference of $45.31.

Leaf grades ranged from 1 to 2, with a test average of 1.3. Values for reflectance (Rd) and yellowness (+b) averaged 83.2 and 7.7, respectively.

Conclusions

These data indicate that substantial differences can be obtained in terms of net value/acre due to seeding rate. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgements

Appreciation is expressed to Weldon Shook for the use of his land, equipment and labor for this demonstration. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the cotton seeding rate trial under center pivot irrigation, Weldon Shook Farm, Seminole, TX, 2010.

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 ----------					
3 seed/ft	36.2	52.5	3449	1250	1812	0.5642	705.14	158.55	863.69	103.47	54.87	705.35 a
2.5 seed/ft	35.9	52.6	3303	1186	1737	0.5642	669.14	151.98	821.12	99.10	45.72	676.29 b
2 seed/ft	35.6	51.7	3250	1158	1680	0.5608	649.30	147.02	796.33	97.49	36.58	662.26 b
3.5 seed/ft	36.4	53.0	3304	1202	1749	0.5575	670.10	153.06	823.16	99.11	64.01	660.04 b
Test average	36.0	52.4	3326	1199	1745	0.5617	673.42	152.65	826.07	99.79	50.30	675.98
CV, %	2.5	2.0	2.4	2.4	2.4	1.4	2.4	2.4	2.4	2.4	--	2.6
OSL	0.7684	0.5742	0.0929†	0.0392	0.0450	0.7091	0.0284	0.0450	0.0312	0.0930†	--	0.0603†
LSD	NS	NS	127	58	83	NS	32.20	7.31	39.51	3.81	--	27.56

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.
$175/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 cotton seeding rate trial under center pivot irrigation, Weldon Shook Farm, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
2 seed/ft	4.5	34.9	80.8	29.3	7.0	2.0	82.8	7.7	2.0	1.0
2.5 seed/ft	4.6	35.3	81.3	29.5	6.9	1.3	83.5	7.8	1.3	1.0
3 seed/ft	4.5	35.4	81.4	29.8	6.6	1.0	83.3	7.7	1.3	1.0
3.5 seed/ft	4.5	35.1	81.1	29.2	7.3	1.0	83.2	7.7	2.0	1.0
Test average	4.5	35.2	81.1	29.5	6.9	1.3	83.2	7.7	1.7	1.0
CV, %	2.5	1.2	0.9	3.8	3.7	21.7	0.3	1.8	--	--
OSL	0.7420	0.5212	0.7409	0.9077	0.0810†	0.0161	0.0483	0.8371	--	--
LSD	NS	NS	NS	NS	0.4	0.6	0.5	NS	--	--

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