



Replicated Seeding Rate Research Trial

Cooperator: Weldon Shook Farms

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Gaines County

Summary: Significant differences were observed for a few of the yield and economic parameters. There were no differences in the HVI fiber quality parameters measured. After adding lint value and seed value, there was no difference in total value/acre for the different seeding rates. When subtracting ginning, seed and technology fee costs, the net value/acre among seeding rates ranged from a high of \$434.86 (2 seed/ft) to a low of \$407.61 (3.5 seed/ft), a difference of \$27.20. Seed and technology cost ranged from a high of \$64.39 (3.5 seed/ft) to a low of \$36.79 (2 seed/ft), a difference of \$27.60. Seed and technology fee costs greatly influenced which seeding rates had the highest net values in the end. These data indicate that very little differences can be obtained in terms of total value per acre. However, differences in seed and technology fees gave way to differences in net value per acre. During the 2011 growing season Gaines County experienced above normal temperatures and very little rainfall. The environmental conditions prior to and during the growing season were a limiting factor in the seeding rates performance overall.

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

Materials and Methods:

Variety: PhytoGen 367WRF

Experimental design: Randomized complete block with 3 replications

Seeding rates: 2 seeds/row-ft in 40-inch row spacing
2.5 seeds/row-ft in 40-inch row spacing
3 seeds/row-ft in 40-inch row spacing
3.5 seeds/row-ft in 40-inch row spacing

Plot size: 8 rows by variable length of the field (1627ft to 2091ft long)

Planting date: 10-May

Irrigation: This location was under a LESA center pivot.

Harvest: Plots were harvested on 14-November 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 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 \$300/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (2, 2.5, 3, or 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/PCGseed10.xls>

Results and Discussion:

Significant differences were observed for a few of the yield and economic parameters (Tables 1). Seed yield ranged from a low of 1072 lb/acre (2 seed/ft) to a high of 1141 (3 seed/ft). Seed yield was indicative of seed values, with 2 seed/ft having the lowest seed value (\$160.80) and 3 seed/ft having the highest seed value (\$171.14). After adding lint value and seed value, there was no difference in total value per acre for the different seeding rates. When subtracting ginning, seed and technology fee costs, the net value per acre among seeding rates ranged from a high of \$434.86 (2 seed/ft) to a low of \$407.61 (3.5 seed/ft), a difference of \$27.20. Seed and technology cost ranged

from a high of \$64.39 (3.5 seed/ft) to a low of \$36.79 (2 seed/ft), a difference of \$27.60. Seed and technology fee costs greatly influenced which seeding rates had the highest net values in the end. There were no differences in the HVI fiber quality parameters measured (Tables 2).

Conclusions:

These data indicate that very little differences can be obtained in terms of total value per acre. However, differences in seed and technology fees gave way to differences in net value per acre. During the 2011 growing season Gaines County experienced above normal temperatures and very little rainfall. The environmental conditions prior to and during the growing season were a limiting factor in the seeding rates performance overall. It should be noted that no inclement weather was encountered at this location prior to harvest and therefore, no pre-harvest losses were observed. Additional multi-site and multi-year applied research is needed to evaluate seeding rates across a series of environments.

Acknowledgements:

Appreciation is expressed to Weldon Shook for the use of his land, equipment and labor for this demonstration.

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Table 1. Harvest results from the Cotton Seeding Rate Trial, Weldon Shook Farm, Seminole, TX, 2011.

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 -----			
PhytoGen 367WRF (2 seed/ft)	30.7	44.8	2393	734	1072	0.5212	382.65	160.80	543.45	71.80	36.79	434.86 a
PhytoGen 367WRF (2.5 seed/ft)	30.3	45.8	2406	729	1102	0.5288	385.64	165.36	551.00	72.19	45.99	432.81 a
PhytoGen 367WRF (3 seed/ft)	30.5	46.2	2469	752	1141	0.5088	382.77	171.14	553.91	74.08	55.19	424.64 a
PhytoGen 367WRF (3.5 seed/ft)	30.7	45.5	2447	752	1114	0.5030	378.37	167.04	545.41	73.41	64.39	407.61 b
Test average	30.5	45.6	2429	742	1107	0.5155	382.36	166.09	548.44	72.87	50.59	424.98
CV, %	3.0	2.4	1.7	1.7	1.7	3.1	1.7	1.7	1.7	1.7	--	1.9
OSL	0.9172	0.5047	0.1880	0.1383	0.0210	0.2922	0.6225	0.0220	0.5339	0.1890	--	0.0218
LSD	NS	NS	NS	NS	37	NS	NS	5.60	NS	NS	--	16.19

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, NS - not significant.

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

Assumes:

\$3.00/cwt ginning cost.

\$300/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, Weldon Shook Farm, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
PhytoGen 367WRF (2 seed/ft)	4.2	33.0	79.5	28.8	9.4	1.3	78.3	9.2	2.0	1.0
PhytoGen 367WRF (2.5 seed/ft)	4.3	33.2	79.6	29.6	9.2	1.3	79.0	9.0	2.0	1.0
PhytoGen 367WRF (3 seed/ft)	4.2	32.6	78.3	28.8	9.3	1.0	78.3	9.2	2.0	1.0
PhytoGen 367WRF (3.5 seed/ft)	4.1	32.3	78.0	27.9	9.4	1.3	79.1	9.5	2.0	1.0
Test average	4.2	32.8	78.8	28.8	9.3	1.3	78.7	9.2	2.0	1.0
CV, %	2.8	1.4	1.4	3.0	1.4	40.0	1.3	2.5	--	--
OSL	0.4321	0.2161	0.2584	0.2145	0.5830	0.8022	0.7326	0.2471	--	--
LSD	NS	NS	NS	NS	NS	NS	NS	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, NS - not significant