

DRYLAND SEEDING RATE BY PLANTING PATTERN TRIALS IN THE TEXAS HIGH PLAINS**Randy Boman****Mark Kelley****Tommy Doederlein****Texas AgriLife Extension Service****Lubbock, TX****Abstract**

Seed and technology costs for dryland cotton (*Gossypium hirsutum* L.) producers in the Texas High Plains are important considerations. In the past, many dryland producers have routinely planted in a skip row pattern. With the release of Roundup Ready and Roundup Ready Flex technologies, many questions concerning the lower end of seeding rates have been asked. Additionally, planting patterns have also come into question, with many producers tending toward solid planting. The objective of this project was to determine the effects of seeding rates and planting patterns on lint yield and quality, and potential profitability in dryland cotton production in West Texas.

This project was initiated in 2003 and conducted for six years at the Lamesa AG-CARES facility in Dawson County. Because of drought, the study produced no harvestable yield in 2006; therefore five years were used in the analysis. Two planting patterns were used which included solid and plant two and skip one row (2x1 or 66.7% planted). Row spacing was 40 inches. Plot dimensions were 16 rows wide by 250 ft long. Seeding rates down the row were 2, 4, and 6 seed/ft. The cultivar planted from 2003-2005 was 'AFD 3511R', a glyphosate tolerant type (Roundup Ready). During 2006-2008 'FiberMax 9058F', a glyphosate tolerant type (Roundup Ready Flex) was planted. Experimental design was a randomized complete block. Three replicates of the six combinations of treatments were used. A John Deere MaxEmerge vacuum planter was adjusted to plant 2, 4, 6 seed/row-ft. The 2x1 pattern was established by plowing out rows as necessary shortly after emergence each year. Land-acre basis seeding rates and seed and technology fee costs based on 2008 pricing for FiberMax 9058F were for the solid planted: 2 seed/row-ft, 26,136, \$27.18; 4 seed/row-ft, 52,272, \$54.36; and 6 seed/row-ft, 78,408, \$81.54. For the 2x1 skip row pattern these were: 2 seed/row-ft, 17,424, \$18.12; 4 seed/row-ft, 34,848, \$36.24; and 6 seed/row-ft, 52,272, \$54.36. A John Deere 7445 stripper harvester was used to harvest the center 8 rows of each plot. The harvested material was dumped into a Crust Buster weigh wagon equipped with integral digital scales and plot weights were acquired. Three-pound grab samples were taken from each plot and were ginned at the Texas AgriLife Research and Extension Center at Lubbock. Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis. Yields (lint and seed) and economic values were calculated on a land-acre basis. Gross loan values (data not presented) were calculated by multiplying lint yields by the 2008 Commodity Credit Corporation loan chart for the HVI values obtained. Seed value was set at \$200/ton (data not presented). Ginning cost was set at \$3/cwt of bur cotton (data not presented). Net value per land acre was determined using combined lint and seed values, minus ginning costs and 2008 seed and technology fee costs (for FiberMax 9058F). Data were combined across years using the Mixed procedure in SAS 9.1 for Windows. Cultivar, Year (Cultivar) and Replicate (Cultivar*Year) were considered random effects. Least-squares means for the five-year data set were reported.

For the duration of the project, no substantial stand losses were encountered due to environmental or mechanical attrition. Wind erosion control practices were timely and accurate. Lint turnout (mean 29.6%) differences were minor but significant at the 0.10 level for 2 vs. 4 and 6 seed/ft solid planted. The 6 seed/ft seeding rate reduced turnout by a difference of 1.7% when compared to 2 seed/ft. Lint yield (mean 437 lb/acre) differences (on a land-acre basis) were noted at the 0.10 level when comparing 2 and 4 vs. 6 seed/ft solid planted. Lint yield was significantly lower for the 6 seed/ft solid planted, attributed to excessive plant competition under dryland conditions. Loan value (mean 0.5451 \$/lb) differences were noted at the 0.10 level when comparing 2 vs. 4 and 6 seed/ft solid planted, and 2 vs. 6 seed/ft 2x1 skip pattern. These arise from slight differences in staple and uniformity. As seeding rate increased, net value per land acre decreased regardless of planting pattern. This was a result of higher seed and technology fee costs with higher seeding rates. When comparing similar seeding rates (52,272) on a land-acre basis (4 seed/ft solid vs. 6 seed/ft 2x1 skip), no differences were observed. Seeding rate and planting pattern had no significant effect on micronaire (mean 4.2 units) or strength (mean 29.1 g/tex). Staple (mean 35.5 32nds inch) was reduced by the highest seeding rate in the solid planting pattern when comparing 2 and 4 vs. 6 seed/ft. When comparing 4 vs. 6 seed/ft for the 2x1 skip pattern a small but significant reduction was noted. No difference in staple was observed when comparing 4 seed/ft solid vs. 6 seed/ft 2x1 skip planting patterns. Uniformity for 4 and 6 seed/ft was reduced when compared to 2 seed/ft in the solid planted treatments. No differences in uniformity were

noted in the 2x1 skip row planting pattern. When comparing similar seeding rates on a land-acre basis slightly higher uniformity (mean 81.2%) was noted for the 2x1 skip row planting pattern vs. the solid planted. These data indicate that over a 5-year time period the 2x1 skip row planting pattern did not exhibit any substantial agronomic benefit in terms of net value per land acre when compared to the solid planting pattern. Seeding rates had a greater effect on yield and fiber quality for the solid planting pattern than for the 2x1 skip row pattern. This is due to excessive competition with the higher plant population arising from the 6 seed/ft seeding rate when compared to 2 and 4 seed/ft. In terms of net value, seeding rate had the greatest effect regardless of planting pattern due to higher seed and technology fee costs.