EFFECTS OF VARIOUS INTRAROW SKIPS ON GROWTH, DEVELOPMENT, AND YIELD IN COTTON

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Abstract

Cotton (Gossypium hirsutum) production and lint quality were evaluated using two varieties in three spacing configurations (Fig. 1) at a constant population of 52,272 plants/acre (average of 4 plants/foot) at Halfway, TX and Lubbock, TX, in 1998. At the Lubbock location the cotton yield only varied 20 pounds per acre among the treatments and, thus, none of the treatments were significantly different. Plant mapping data revealed some treatment differences in the first position fruiting percentage retention, however, no trends could be identified. This same observation was noted for the lint strength and micronaire and, again, no cause and effect relationship could be identified.

Introduction

Over the years planters have become much more accurate in their placement of seed. In many crops, such as corn and sorghum, placement of seed at an equal distance within the row has had positive effects on their yields. This study evaluated cotton planted on 40-inch rows to determine if intra-row spacing directly effects the yield and the lint quality of two stripper cotton varieties on the High Plains.

Materials and Methods

A field study was conducted in 1998 at the Texas Agriculture Experiment Station at Halfway, TX and the Texas Tech University Research Farm east of New Deal. Sixty pounds of nitrogen were applied pre-plant, sixty pounds sidedressed, and a pint and a half of Treflan was incorporated into the soil for weed control. Two varieties, PM2200RR and PM2326RR at rates of 152,000 and 144,000 seeds per acre, respectfully, were planted with a John Deere MaxEmerge II planter on May 19. Temik was applied at a rate of 3 lbs. per acre at planting. A Randomized Block Design was used with four replications of the four treatments. After planting, the soil was wet to within 0.5 inch of the surface using a drip system with tapes spaced every forty inches below each seedbed. Twelve days after planting a tank mix of Staple @ 1.5oz, MSMA @ 8 oz, and Bidrin for thrip control @ 3.0 oz was applied. When the cotton reached the first true leaf stage it was thinned to one plant every three inches (Trt. 1), four plants in six inches followed by a six inch skip (Trt. 2), eight plants in 12 inches followed by a 12 inch skip (Trt. 3), and twelve plants in 18 inches followed by an 18 inch skip (Trt. 4). These treatments are depicted in Fig. 1. Bidrin was applied again the day after thinning @ 3.0 oz for thrip control. Six plants from each plot were randomly selected to be plant mapped. In plots that had skips, three plants were taken from the middle of the clump and three were taken from the outside. Plant mappings were made on July 15, August 5, August 26, and at harvest on October 21 to determine plant height, node number, estimated yield, and percent fruit retention. On August 7 the following applications were made: 4 oz/acre Karate for bollworm, 8.5 oz/acre Pirate for beet armyworm, 4 oz/acre Bidrin for control of aphids, and 8 oz/acre Pix to control growth of cotton. Plots were defoliated using Prep and Ginstar on October 7 and harvested on October 26. Thirteen feet of row (1/1000 of an acre) was harvested from each plot and dried before ginning at the Texas Agricultural Experiment Station on November 6. Lint samples were kept for each plot and processed by the International Textile Center, Texas Tech University, Lubbock, TX for fiber quality.

Result and Discussion

In 1998 there was little rainfall, but due to the drip system the soil profile was full throughout the year. Plants were subject to little stress, if any, which resulted in no significant differences in yield among the treatments for both varieties (see figure 2). Differences were observed in 1st position fruit retention for the variety PM2200RR. Treatment 2 had a significantly lower 1st position retention percentage (43.8%) when compared to treatment 1 (53.5%), treatment 3 (55.3%), and treatment 4 (59.1%) (see figure 3). Differences in lint quality were also observed in the PM2200RR variety. Treatment 4 produced lint with the highest strength (30.7 g/tex) (see figure 4). Treatments 1 and 3 produced lint with an intermediate strength (29.7 and 29.9 g/tex, respectively). Treatment 2 resulted in the lowest strength (29.0 g/tex). For the variety PM2200RR, treatment 4 had a lower micronaire fiber (3.9) than that from treatments 1, 2, and 3 (4.1, 4.3, and 4.2, respectively) (see figure 5). No differences in any of the parameters were noted for the variety PM2326RR.

Summary

There were no significant differences in yield. This likely was due to the plants not being stressed throughout the year and, thus, allowing for plants near the skips to compensate. While some differences were noted for lint strength and micronaire in the PM2200RR variety, no trends could be identified. During 1999 we plan to expand the study to include three irrigation levels (0, 50, and 100% ET

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:640-642 (1999)
National Cotton Council, Memphis TN

replacement) and two plant populations (26,136 and 52,272 plants/acre).

Acknowledgements

We want to thank the Texas Legislature for funding the Precision Ag Project through the Texas Agricultural Experiment Station. Also thanks to Ben Duesterhaus, Katie Williams, Dewayne Hovey, and Trishell Miller for helping thin the plots and plant mapping.

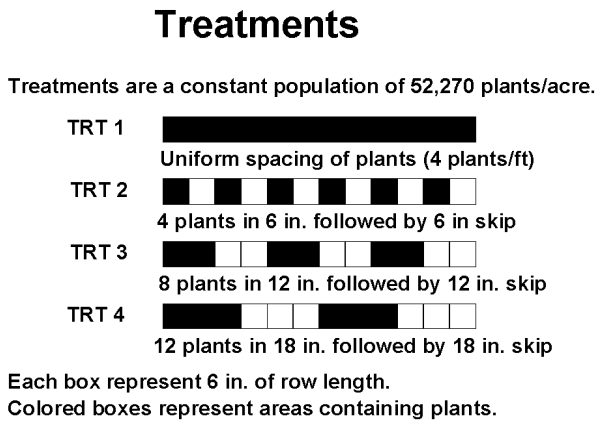

Figure 1. Explanation of treatments

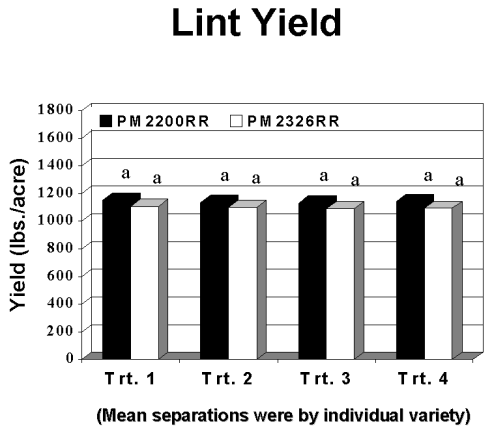

Figure 2. Lint yield

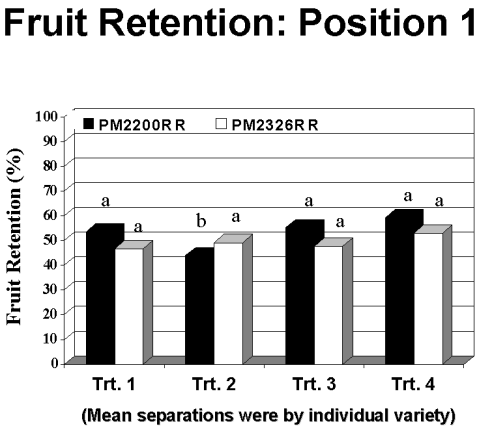

Figure 3. Fruit retention: position 1

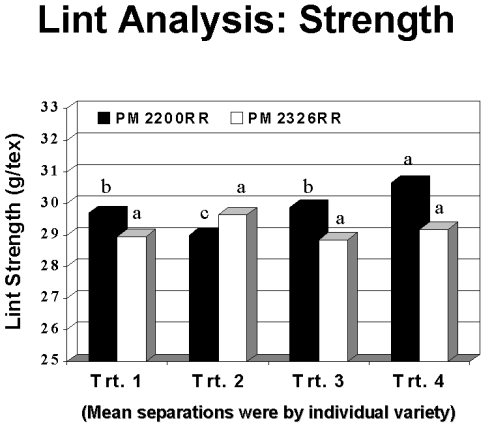

Figure 4. Lint analysis for strength

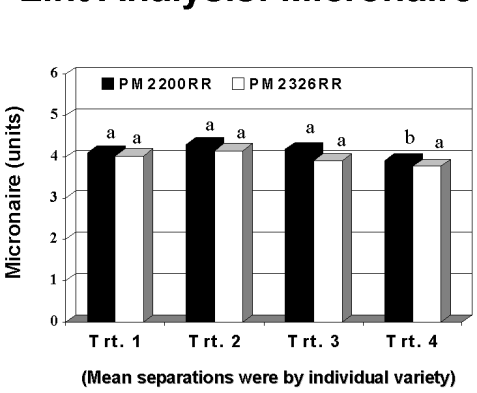

Figure 5. Lint analysis for micronaire