EFFECTS OF POPULATION, VARIETY, AND ROW SPACING ON COTTON GROWTH, LINT YIELD AND FIBER QUALITY IN THE COASTAL PLAINS OF SOUTH TEXAS

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Abstract

The need to reduce cost of production has renewed interest in evaluating ultra-narrow row cotton production systems (UNRC). The advent of herbicide tolerant transgenic cultivars in the US cottonbelt has further increased the interest in this technology. We conducted two experiments (1) to obtain information on the response of cotton plants to row spacing and plant populations for dryland production and (2) to evaluate the growth habits and yield four early season cultivars planted in 15-inch rows. Both studies were conducted at the Texas A&M University Research and Extension Center at Corpus Christi, Texas during the 1998 growing season. The first experiment was planted with cultivar STV BXN 47 using two row spacings and three plant densities per acre. These were (1) 30-inch rows - 50,000 plants per acre, (2) 15-inch rows – 50,000 plants per acre, (3) 15-inch rows –75,000 plants per acre and (4) 15-inch rows – 100,000 plants per acre. The yield response presented in Figure 1 shows that cottons planted at 15-inch rows – 50,000 plants per acre may have a yield advantage over higher populations under the dryland conditions of South Texas. The data indicates that high plant densities planted in 15-inch rows may create excessive inter-plant competition, leading to premature onset of water stress and reduced lint yield and fiber quality. The 15-inch row – 50,000 plants per acre treatment displayed the benefits of ultra-narrow rows in obtaining a faster canopy cover. This characteristic may reduce water loss through evaporation from the soil resulting in improved water use efficiency. Also, this observation may explain the significantly higher yield of the 15-inch rows versus the 30-inch row plots planted at 50,000 plants per acre.

In the second study, the cultivars DP 5557, STV BXN 47, Texas 300 and an experimental line CRP-R16 were used. The latter is a cultivar with columnar, semi-cluster growth habits developed at the Texas A&M University Research and Extension Center, Corpus Christi, TX. The four cultivars were planted in 15-inch rows at a plant density of 75,000 plants per acre. Data displayed in Figure 2 shows that the columnar growth habits of CRP-R16 might have an advantage over conventional cultivars. Further studies need to be conducted to evaluate the suitability of columnar cottons to ultra-narrow row configurations.

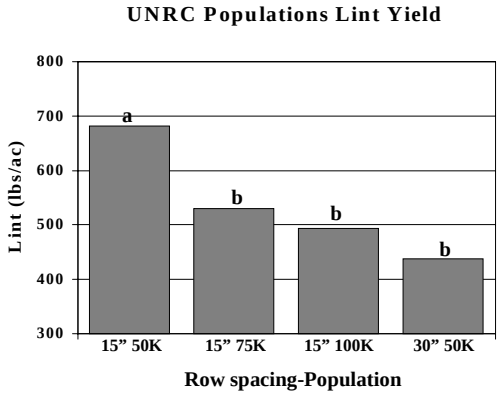

Figure 1. Yield response to row spacing and plant population. Corpus Christi, TX.

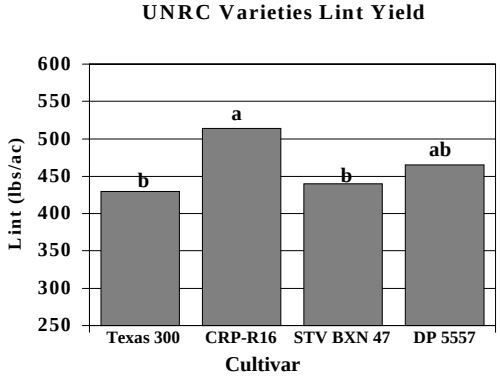

Figure 2. Yield of four cultivars planted in 15-inch rows; 75,000 plants/acre, Corpus Christi, TX, 1998.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:615-615 (1999)
National Cotton Council, Memphis TN