Cotton Seeding Rates: How Low Can We Go?

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Rising costs of planting seed and technology fees have led some cotton producers to reduce their seeding rates in an effort to control costs. How far can we turn down the planter without hurting lint yield, fiber quality, and the bottom line? To address this question, we conducted small-plot experiments in two fields at the Milan Research & Education Center in Tennessee for three years. One field was managed with no tillage and no irrigation, while the other was conventionally tilled and pivot irrigated. Seeding rate varied with planting pattern (solid and skip-row), row spacing (15 and 30 inches), and number of seeds planted per foot of row (1 or 2 viable seed/ft). Cultivars were ST4357B2RF (2006) and ST4554B2RF (2007-08). Seed costs and tech fees ranged from $25.31 with 14,500 seed/ac, to $108.38 at 87,100 seed/ac. Plant stands were counted, and plots were rated for weed competition during the season. Earliness was measured as days from planting to 50% open bolls. Plots were spindle picked with a JD9930 harvester equipped with Pro-12 VRS headers for yield and fiber quality.

With no tillage and no irrigation, plant stands averaged 61% of seeds planted, final plant height averaged 29 inches, and lint yields averaged 1020 lb/ac. The highest lint yields were obtained with seeding rates ranging from 44,000 to 87,000/ac (26,000 to 49,000 plants/ac). The lowest yield was obtained with 14,500 seed (9,200 plants) per acre, which produced 81% of maximum yield. The highest seeding rates produced the earliest maturing cotton, while the lowest seeding rates (14,500 to 29,000/acre) delayed maturity by about five days. Suppression of weeds by cotton diminished with plant populations less than 26,000/ac, especially in skip rows. In solid planted rows, maximum net return was obtained from seeding rate of 44,000/ac. Net return was reduced at higher seeding rates by about $40 to $80/ac, due to higher seed costs and technology fees. In skip-row plantings, highest net returns were obtained from seeding rates ranging from 29,000 to 58,000/ac. Net return was reduced by about $52/ac at a plant population of 9,200/ac, due to lower yields.

With conventional tillage and supplemental irrigation, plant stands averaged 57% of seeds planted, final plant height averaged 39 inches, and lint yields averaged 1421 lb/ac. The highest yields were obtained with seeding rates ranging from 44,000 to 87,000/ac, with plant populations in excess of 24,000/ac. The lowest yield was obtained with 14,500 seed (8,900 plants) per acre, which produced 65% of maximum yield. The highest yielding populations also matured about four days earlier than cotton grown at the lowest seeding rates. The cotton crop suppressed weeds most effectively in solid plantings with more than 24,000 plants/ac. Seeding rates ranging from 29,000 to 87,000 seeds/ac produced equivalently high net revenues. In solid-planted rows, net return was reduced $109/ac with 12,300 plants/ac, due to lower lint yields. In skip rows, net return was similarly reduced $189/ac with a population of only 8,900 plants/ac. There were no significant price differences for fiber quality due to seeding rate in any row spacing or pattern in either experiment. Results suggest that growth of larger plants under irrigation may increase the capacity of cotton to compensate for lower seeding rates. Across the two fields, however, net returns were more consistently maximized by planting two seeds per foot in skip-rows than by reducing the seeding rate down the row. Δ