ULTRA-NARROW-ROW COTTON RESEARCH IN TENNESSEE

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Abstract

Cotton performance in ultra-narrow rows (UNR) was evaluated by the University of Tennessee in the early 1970's, but progress in production technology warrants reevaluation of UNR cotton. New technologies include no-till cotton production methods, earlier-maturing cultivars, improved over-the-top herbicide systems, growth regulators such as mepiquat chloride (Pix), and HVI classing procedures. Meanwhile, rising costs of spindle picking have revived interest in possible alternatives such as finger stripping. Current studies in Tennesseee are intended to evaluate performance of early-maturing cotton as influenced by row spacing, weed competition, Pix, and harvest methods. Field experiments were conducted at Milan Experiment Station in 1994 and 1995, using no tillage. The 1995 study of row spacing, Pix, and harvest method was planted May 10, and 2058 DD60's accumulated by harvest on Oct. 7. In this study, 'Deltapine 20' was planted in 10", 20", and 40" rows as main plots. Multiple Pix applications (totalling 0 and 0.077 lb a.i./acre) were subplot treatments in a RCB split-plot arrangement. Row-spacing-by-harvest-method treatments included 10" and 20" rows harvested with an Allis Chalmers finger stripper, and 20" and 40" rows harvested with a John Deere spindle picker.

Plant populations per acre in 1995 averaged 79,000 in 10" rows, 60,000 in 20" rows, and 36,000 in 40" rows. Plant height did not vary significantly with row width, but Pix reduced average maximum height from 39" to 26". Maximum vegetative branch length was 40% less in 10" or 20" rows than in 40" rows. Pix also tended (P=0.10) to reduce vegetative branch length, and it significantly reduced maximum leaf area index (LAI) at cutout. LAI ranged from 2.6 with Pix in 40" rows, to 4.9 without Pix in 10" rows. Row spacing did not affect the percent of bolls on the first five fruiting branches, but Pix increased this percentage from 54 to 71%. The percent of fruiting branch bolls at first-position sites was higher in 10" or 20" rows (81%) than in 40" rows (66%), but was not influenced by Pix. Lint yields were significantly higher in Pix-treated, stripped 10" and 20" rows (at 1021 and 1034 lb/ac respectively) than in picked 20" or 40" rows with or without Pix. Pix significantly increased lint yields in 10" rows but not in other row widths. Yield differences between stripped and picked 20" rows (999 and 846 lb lint/ac respectively) may be attributed to differences in machine harvesting efficiency, as gin turnouts averaged 31% in stripped plots and 36% in picked plots. Picked 20" rows outyielded 40" rows by 30%, possibly due to lower LAI and fewer bolls/acre in 40" rows, especially at first position sites. HVI trash area was significantly higher in lint from stripped (1.0%) than picked (0.5%) plots. Color +b was also higher in lint from stripped plots, but this did not change HVI color grade (41-3) appreciably. In a companion study at Milan Experiment Station, two "picker varieties", ST 132 and DPL 20, had higher lint yields, gin turnouts and micronaire in stripped 10" rows than two "stripper varieties", HS 200 and HY 007.

These preliminary results suggest that UNR may offer an alternate cotton cropping system for some situations in Tennessee in the future. So far, UNR cotton appears compatible with no-tillage systems and responds favorably to earliness management tools such as Pix. More research is especially needed on planting and harvesting technology, weed management, grade optimization, production economics, and marketing.

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