

EVALUATION OF COTMAN FOR USE IN ULTRA-NARROW ROW COTTON IN MISSISSIPPI.

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ABSTRACT: The purpose of this trial was to determine the main-stem node number of the last effective boll population in ultra-narrow row (UNR) cotton compared to wide-row cotton, and to evaluate the fit of the COTMAN computer program for UNR cotton. Tests were planted at the North Mississippi Research and Extension Center, Verona, MS. In this trial, the last effective bolls in the UNR plots were essentially those tagged at 4 nodes above white flower (NAWF). The wide-row plots had consistently more bolls tagged at the 5-7 NAWF positions. Plots of data showing NAWF vs. days after planting indicate that UNR cotton lag behind the wide-row crop in NAWF throughout the season. The program may need to be adjusted for UNR cotton to provide a more reasonable window for cut-out.

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MATERIALS AND METHODS: The statistical design was randomized complete block with 4 replicates of UNR and wide-row spacing. Cotton, variety ST 4892 BR, was planted with triple treated seed at the North Mississippi Research and Extension Center, Verona, MS on 5/23/01 at a seed rate of 3 per ft. Wide-row plots were four rows 38 inch (96.2 cm) wide and 500 ft (152.4 m) long. Ultra narrow row cotton plots were 19 rows wide with 8.7 in (22.1 cm) row spacing inch wide-rows and 4 row buffer on either side of the trial. Fruiting data essential for use in the COTMAN program was collected from 10 random plants per plot (80 plants total) until first bloom. At first flower, 15 random plants per plot were flagged for subsequent flower tagging. On each flagged plant only, all first position flowers were tagged every other day with date and Node Above White Flower (NAWF). White flowers were tagged with the current date. If the flower was pink, it was tagged with the previous day's date. White blooms were tagged until the last first-position white or pink flower had bloomed. Flagged plants were cut two days before machine harvest, placed in plastic bags, and taken to the laboratory. Tagged bolls from these plants were sorted according to julian date and NAWF for each plot. Bolls were allowed to air dry and were then individually weighed. One hundred ft of the center two rows in each plot of wide-row cotton was picked with a 2-row picker. Eleven rows in the center of each ultra narrow plot was harvested with a stripper for 100 ft.

RESULTS AND DISCUSSION: The purpose of the test is to determine the fit of the COTMAN computer program for ultra narrow row cotton. The tracking of the fruit in the first position relative to the first fruit or white flower as is done by the COTMAN program is depicted in Figure 1. The node above white flower 5 (NAWF-5) fruiting level is normally accepted as the beginning of physiological cutout when plants begin to decrease the number of nodes above white flower during maturation of the plant. The ultra narrow row cotton never reached a growth stage of 5 NAWF, and began cut-out after reaching NAWF-4. Figure 1 demonstrates the tracking ability of the program to identify points of change in the fruiting of the plant, however, the NAWF position used to define cut-out may need to be redefined. Figure 2 indicates the number of instances of first position fruit sampled for each NAWF position during the trial and demonstrates that UNR cotton has more in the 2 to 3 NAWF category than wide-row and fewer in the 4 to 7 NAWF bracket. Figure three relates boll weight to two other parameters, NAWF when the bolls were tagged as white blooms, and date. The data indicate that plants in the UNR plots had larger bolls in the upper level of the plants than did plants in the wide-row plantings. This was a year of adequate rainfall, and results are likely to be considerably different during a season when drought is a factor. In that case, both cottons should cut-out sooner, and blooms occurring late in the season would have little chance of filling to potential size.

Yield was calculated to be 3215 lb seed cotton per acre for the UNR, and 2024 lb/ac for the wide-row cotton. These data are based on 59,675 and 13,756 row ft for the UNR and wide-row plots, respectively, and are significantly different ($p=0.05$; LSD). The mean stand count for the UNR and wide-row plots was 138,000 and 35,000, respectively. In this trial, the last effective bolls in the UNR plots were essentially those tagged at 4 nodes above

white flower (NAWF). The wide-row plots had consistently more bolls tagged at the 5-7 NAWF positions. Plots of data showing NAWF vs. days after planting indicate that UNR cotton lagged behind the wide-row crop throughout the season. The program may need to be adjusted for UNR cotton to provide a more reasonable window for cut-out.

Results indicate that the COTMAN program will also be useable for UNR cotton, but that some parameters including the NAWF for the expected initiation of cut-out will need to be adapted specifically for UNR crops.

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Figure 1. Typical fruiting curves for UNR and wide-row cotton.

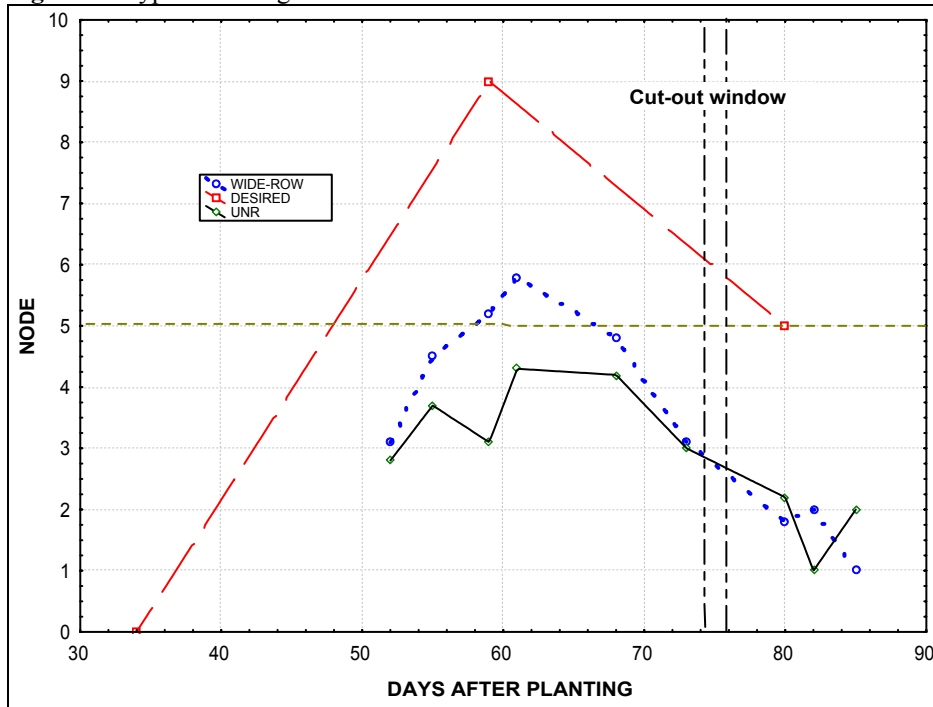


Figure 2. Frequencies of NAWF occurrences in UNR and wide-row cotton.

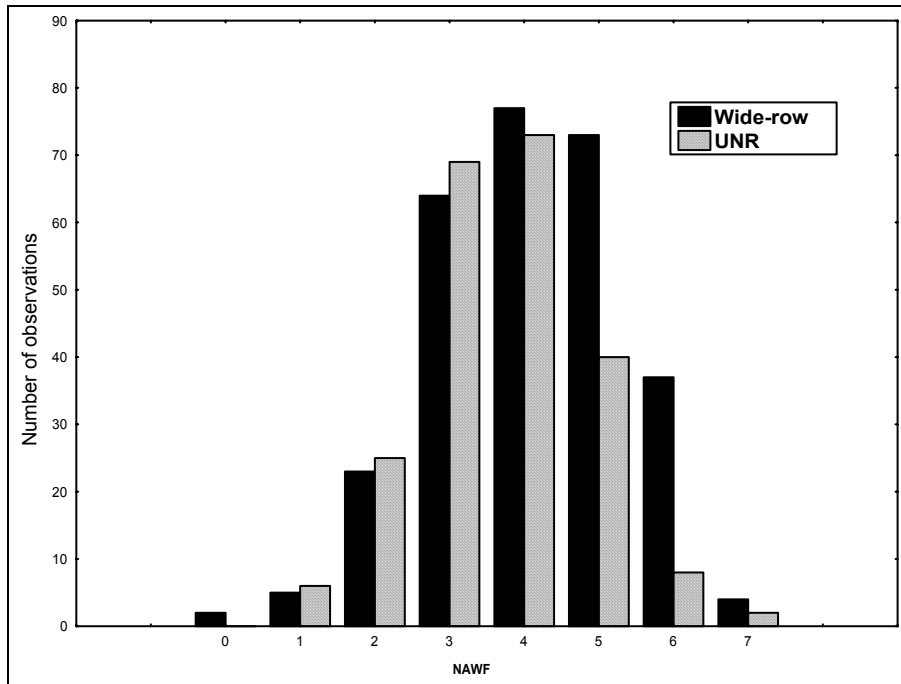


Figure 3. Mean weight (gr) of individual bolls tagged as white blooms as related to Julian date and NAWF for UNR and wide-row cotton.

