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ADAPTATION OF COTMAN FOR USE IN UNR COTTON

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Abstract

Late-season crop management with COTMAN depends on identifying the last effective boll (LEB) population. For wide (38- 40-inch) row cotton, COTMAN assumes that LEB is set either at 5 nodes above white flower (NAWF= 5), or by a historical-weather-based last effective bloom date for the location, whichever occurs first. An objective of this study was to improve adaptation of COTMAN by determining the LEB in UNR cotton (10-inch rows or less) in a range of typical field environments, as compared to wide-row cotton. A 3-year study was conducted in AR, MS, NC, TN and TX with replicated UNR and wide-row plots. Growth and development were monitored with COTMAN. First-position blooms were tagged with date and NAWF at anthesis. Tagged bolls were hand-picked, counted, and weighed by NAWF for each plot. Plots were also mechanically harvested for lint yield. Boll 'effectiveness' was evaluated by NAWF in terms of boll frequency, size, contribution to yield, and earliness. Data were statistically analyzed with NAWF data nested within row spacings. By all 'effectiveness' criteria, the LEB in UNR was set higher on the plant than NAWF=5 in AR, MS, NC, and TN. In UNR, more first-position seedcotton came from NAWF= 3 and 4 in AR, NC, and TN; from NAWF= 4 in MS; and from NAWF= 5 to 8 in TX; than from other NAWF fruiting sites. All bolls were set before the last effective bloom date, except for NAWF= 1 bolls in NC. In UNR, only 20 to 40% of first-position yield was accumulated up to and including NAWF= 5, except in TX (2003). Results suggest that in UNR, the LEB was set higher on the plant than NAWF= 5 in most (but not all) environments. For use in UNR and other situations, it would be advantageous for COTMAN to allow users to specify the last effective boll population of a particular crop.

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