

## **LAST EFFECTIVE BOLL POPULATION STUDIES**

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### **Abstract**

The last effective bolls (LEB) are the last bolls produced by a crop that are likely to contribute to economic yield. The COTMAN™ Expert System assumes that LEB is set either at 5 nodes above white flower (NAWF 5), or by the effective bloom date based on weather history of the location, whichever occurs first. Experience in ultra-narrow row (UNR) cotton, however, suggests that LEB may be set higher on the plant than NAWF 5. A regional study was initiated in 2001 in five states to determine the main-stem node number of the LEB population in UNR cotton, as grown in a range of typical field environments, compared to wide-row cotton in these environments. This is a preliminary report of results from two states for the first two years of the study. Four replications each of UNR and wide-row configurations were planted at Clayton NC and Milan TN in early May of 2001 and 2002. First-position flowers on 15 or 16 plants per plot were tagged with date and NAWF data. Tagged bolls were hand-picked and counted by NAWF, and the seedcotton air-dried and weighed by NAWF from each plot. Boll data were analyzed by SAS Proc Mixed with reps and environments treated as random effects, row spacing and NAWF position treated as fixed effects, and NAWF data nested within row spacings. Boll “effectiveness” was evaluated in terms of boll frequency, size, relative contribution to yield, and earliness. Lint yields from mechanical harvests did not differ significantly between row spacings. In all years, locations, and row spacings, plants rarely exhibited more than 8 NAWF. Bolls were most frequently set at NAWF 3 through 6 in wide rows, and at NAWF 3 through 5 in UNR cotton. Boll size was equivalently high at NAWF 3 through 6 in wide rows, and at NAWF 3 through 8 in UNR. The greatest contribution to first-position yield came from NAWF 4 and 5 in wide rows, and from NAWF 3 and 4 in UNR. In these early-planted studies, all first-position bolls lower than NAWF 1 on the plant were set before the last effective bloom date in 50% of years at these locations. Bolls from NAWF 5 and below (lower on plant) collectively contributed about 40% of first-position yield in UNR, and about 60% of first-position yield in wide rows. These preliminary data suggest that the LEB may be set higher on the plant than NAWF 5 in some circumstances, such as in UNR where cotton produces an early, compact fruit set. This regional study is still in progress, however, so it is too soon to draw broad conclusions.

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