VALIDATING NAWF5 AS A MEASURE OF CROP "CUT OUT" IN NORTH LOUISIANA

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Abstract

Validating node above white flower (NAWF)5 as a measure of physiological "cut out" for selected cotton varieties (NuCOTN 33^B and Sure-Grow 821) in North Louisiana during 1998 was a primary objective in studies to refine late-season cotton insecticide termination strategies. A two-factor study consisting of NAWF stage (main plot) and method of square removal (subplot) was used to determine when the last harvestable boll population develops on cotton plants. NAWF stages included 4 levels (NAWF6, NAWF5, NAWF4, and NAWF3). Methods of square removal included stripping squares, main stem/terminal removal, and a non-damaged control. These experiments had treatments arranged in a split plot within a RCB design and each treatment combination was replicated four times. NuCOTN 33^B was planted 6 May and Sure-Grow 821 on 29 May in plots 3 rows (40 inch centers) x 10 ft. The center row of each plot was thinned to 2 plants/foot within 3 weeks after plant emergence. NAWF measurements were initiated during the first week of flowering for NuCOTN 33^B and Sure-Grow 821 on 10 July and 21 July, respectively. NAWF was recorded twice weekly until the square removal treatments were applied to the plots. Treatments were applied on the first sampling day that NAWF had fallen below each application stage. At each NAWF stage, all plants were marked on their main stem with a yellow snap-on-tag (A. M. Leonard, Piqua, OH). The tags were placed above the uppermost main stem fruiting branch with a first position white flower. In the non-damaged control plots, the tag was used to divide the plants into upper and lower vertical zones based on each NAWF stage of plant development. In the square stripping treatments, all squares on fruiting branches above the tag were removed, but the main stem and fruiting branches were not damaged. In the main stem/terminal removal treatment, the main stem just above the tag was severed with scissors. Each treatment was applied to the plots only once. Crop maturity was based on percent open bolls immediately prior to harvest aid application on 15 September, and 25 September in the NuCOTN 33^B and Sure-Grow 821 tests, respectively. Seedcotton yields were measured by hand-harvesting the entire treated row on 1 October and 8 October in the NuCOTN 33^B and Sure-Grow 821 tests, respectively.

In the NuCOTN 33^B test, there were no significant differences in crop maturity based on percent open bolls among the NAWF stages within the non-damaged control ($\underline{P}$ = 0.263, 82-91% open), main stem/terminal removal ($\underline{P}$ = 0.532, 83-95% open), and square stripping ($\underline{P}$ = 0.103, 77-91% open). Total seedcotton yields significantly increased ($\underline{P}$ = 0.025) when the main stem/terminal removal treatment was delayed until the NAWF4 and NAWF3 growth stages compared to yields when this treatment was applied at the NAWF6 and NAWF5 stages. No significant differences ($\underline{P}$ = 0.470) in yields were observed among NAWF stages for the square stripping treatment. However, numerical trends were similar to that for the main stem/terminal removal treatments. Significant yield differences among NAWF stages in the lower ($\underline{P}$ = 0.032) and upper ($\underline{P}$ = 0.005) zones were observed in the control plots. Seedcotton yields harvested in the lower zone at NAWF4 were significantly higher than that in the NAWF6 and NAWF5 plots. Higher yields in the upper zone were harvested in the NAWF6 and NAWF5 plots compared to yields in the NAWF4 plots. Yields in the upper zone (above the main stem tag) represented 18.3%, 11.8%, and 4.8% of the total seedcotton harvested in NAWF6, NAWF5, and NAWF4 non-damaged control plots.

In the Sure-Grow 821 test, , there were no significant differences in crop maturity based on percent open bolls among the NAWF stages within the non-damaged control ($\underline{P}$ = 0.912, 74-81% open), and square stripping ($\underline{P}$ = 0.113, 63-88% open). However, there were significant differences in crop maturity based on percent open bolls in the main stem/terminal removal treatment ($\underline{P}$ = 0.001, 61-89% open). Plots receiving this treatment at NAWF6 and NAWF5 had fewer open bolls at defoliation compared to that in the NAWF4 and NAWF3 plots. No significant differences in total seedcotton yields ($\underline{P}$ = 0.063) were observed among NAWF stages for the main stem/terminal removal treatment. However, yields consistently increased as this treatment was delayed from NAWF6 to NAWF3. No significant differences in total seedcotton yield ($\underline{P}$ = 0.662) were observed among NAWF stages for the square stripping treatment. In the non-damaged control plots, there were no significant yield differences among NAWF stages ($\underline{P}$ = 0.222) in the lower zone. There were significant differences ($\underline{P}$ = 0.003) among NAWF stages in seedcotton yields in the upper zone. Yields in the upper zone of NAWF6 and NAWF5 plots were higher than yields in NAWF4 and NAWF3 plots. Yields in the upper zone (above the main stem tag) represented 22.2%, 25.5%, and 7.1% and 2.6% of the total seedcotton harvested in NAWF6, NAWF5, NAWF4, and NAWF3 non-damaged control plots.

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