

Compensation of Cotton to Square Removal at Various Rates

by

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Compensation of Cotton to Square Removal with Different Varieties and Planting Dates

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Abstract

Fruit abscission is a natural occurrence in cotton. Fruiting retention is very important since yields are highly correlated with number of bolls produced. There are many factors contributing to the abscission of squares by cotton, including environmental conditions, heavy boll load, diseases, and insect feeding. An experiment was designed to evaluate the compensation capacity of cotton at various levels of square removal using two cotton cultivars at two planting dates over two Virginia locations; the effect of mechanical square removal on cotton yield components and quality; and to evaluate the use and effectiveness of COTMAN in tracking major phenological stages PHS, FF, and Cutout of cotton at various rates of square removal. In 1998, DPL 51 was planted on May first at the Tidewater Agricultural Research and Extension Center in Suffolk, Virginia. This was an ideal location, planting date, and variety, so in 1999, the experiment was expanded to ascertain whether cotton would have the same compensation capacity in less ideal conditions. In 1999, two varieties were planted, DPL 51 (early maturing) and DPL 5111 (late maturing), on two planting dates (two weeks apart), and in a location outside the traditional cotton growing region, the Southern Piedmont AREC in Blackstone, Virginia. Five levels of manual desquaring treatments (0%, 12-15%, 20-25%, and 30-40% of first position squares, and 20% of small bolls [Suffolk, 1999 only]) were used in both years. The physiological progress of the crop was monitored using the COTMAN cotton monitoring system and compared to the Target Development Curve (TDC). Over both years, there were no significant differences in boll numbers or yield among any of the square removal treatments. Comparison of fruiting curves with the TDC showed that in both 1998 and 1999, the influence of square removal in excess of 30-40% resulted in a lower apogee and premature cut-out. Also, though not statistically significant, yield was greatly reduced at the 30-40% square removal rate, often by as much as 448 kg/ha. In many cases, a lower level of square removal (varying between the 12-15% and the 20-25% rates) seemed to stimulate the growth and development of the crop. It may also contribute to a higher level of square retention. The results of this study suggest that cotton plants will compensate for up to 30% of first position square loss, with no reduction in yields.

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