ILLUSTRATION OF CROP GROWTH PATTERNS GENERATED BY COTMAN

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Abstract

Monitoring the pattern of crop growth and development throughout the season provides an opportunity to recognize problems in a timely fashion. COTMAN is a computer-aided cotton management system that, in addition to other parameters, generates a crop growth pattern based on number of main-stem squaring nodes. A plot of squaring nodes (an expression of nodes-above-first-square prior to flowering and nodes-above-white-flower after flowering) by days from planting provides a continuous growth pattern throughout the effective fruiting period. Interpretation of growth patterns can be made by comparisons to a standard, the target development curve. The purpose of this paper was to illustrate the use and interpretation of crop growth patterns generated by COTMAN within irrigated and non-irrigated tests that were conducted in 1996 at the Southeast Branch Experiment Station near Rohwer, AR. Within each test, combinations of three planting dates (PD = early, mid, late), four seeding methods (SM = low, medium, and high densities at optimum depth plus high density at increased depth), and mepiquat chloride (MC = one or no treatment) were used to establish contrasting growth patterns of one cultivar. Data collected included all COTMAN variables, yield and fiber quality. The R-square values were very high in both tests and few interactions were significant. Maturity (measured by days to NAWF=5) was significantly affected by PD and MC in both tests and by SM in the non-irrigated test. Lint yield was significantly affected by PD in both tests and by SM and interaction of SM and MC in the non-irrigated tests. Maturity differences associated with the treatments were evident by relative position, apogee and slope of the growth curves. In most cases the differences could be detected very early in the season. Data for these contrasting growth curves which were associated with known factors have provided valuable testing of the COTMAN software. Evaluation of the data has strengthened and enhanced our interpretation of the COTMAN growth curves.

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