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FOLIAR FERTILIZATION OF COTTON

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Abstract

The Cotton Nutrient Monitoring (CNM) program in Arkansas was established to provide a tool producers could utilize to avoid over fertilization of cotton. As prices of fertilizer have increased and producers better understand the role of nitrogen (N) fertilization, the occurrence of over-fertilization is much more rare. With the onset of boll weevil eradication and the increased use of Bollgard technology, fruit retention rates often are very high at first flower. This situation presents a challenge to the producer to meet the enormous demands for water and nutrients after flowering begins to avoid significant shed of fruit. Utilizing the COTMAN program in conjunction with the CNM program, producers can better evaluate the demand of the boll load on the plant in relationship to the N status in making decisions on the need for supplemental N fertilization. The objective of this study was to establish a guideline using COTMAN and the CNM program to evaluate the need for supplemental N fertility, and to evaluate the effectiveness of various N foliar products. Comparisons were made in producer fields. Treatments were replicated 4 times over a period of five years. Petiole samples and COTMAN data were collected on a weekly basis beginning near MHS. Foliar products were applied by ground beginning the second week of flowering. Treatments include an untreated check, CoRoN (25-0-0, 2.0 gallons in two applications), and a 23% urea solution (9.0 gallons in three applications). In 1999, boll load resulted in NAWF values tracking parallel to the target development curve (TDC) in COTMAN. Trend lines from CNM indicated deficient N status was impending prior to or at the third week of flower. A significant yield response of slightly over 100 pounds of lint per acre was observed with foliar feeding. The CNM program recommended foliar N one week after treatment was initiated. The following year, the boll load and growing conditions did not result in NAWF values tracking parallel to the TDC. Trend lines from CNM did not predict a deficient N situation until the fifth week of bloom. Foliar feeding did not result in a yield response although a recommendation was made to apply foliar N by the CNM program. During the course of this study with foliar N treatments being applied regardless of boll load and nutritional status, CoRoN numerically out yielded the untreated control in four of the five years by an average of 32 pounds. The 23% liquid urea treatment contained an extra application expenses and faired better than the untreated control numerically three of the five years by an average of only 17 pounds. Numerical yield responses can often be obtained with foliar fertilization regardless of boll load or N status, but it may not be cost effective. Utilizing COTMAN to evaluate the demands placed on the plant during boll fill coupled with knowledge of the nutritional status of the plant can result in significant yield improvements and economical returns when the need for foliar feeding is properly identified.