

**UTILIZATION OF CORON® TO COMPENSATE NITRATE DEFICIENCIES IDENTIFIED BY PETIOLE ANALYSIS**

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**Abstract**

Traditionally, fertility programs in cotton (*Gossypium hirsutum* L.) consisted of preplant and/or early season applications of fertilizers based on recommendations following soil analysis. As the EPA implements comprehensive Nutrient Management Plans for all aspects of agriculture it may become necessary to manage the nutrient requirements differently than in the past. Over the years many studies have demonstrated the utility of foliar fertilization as a component of a complete fertility program in cotton. CoRoN is a true liquid nitrogen that comes in several formulations that can be foliar applied to a multitude of crops. This study was conducted to evaluate petiole meters as a tool to monitor nitrate levels and to determine if CoRoN treatments can alter the nitrate levels in cotton.

Large scale field studies were conducted in Cheneyville, LA, Clarksdale, MS, Meridianville, AL, Somerville, TN, and Tanner, AL in 2000. Each location utilized locally adapted varieties with four locations using transgenic varieties and one location using a conventional variety. The Clarksdale, MS and Meridianville, AL locations were irrigated as needed throughout the season. Standard agronomic practices including normal fertility regimes were followed at all locations. Four CoRoN 25-0-0 0.5%B treatments and an untreated check or standard were evaluated at each location. The CoRoN treatments were 1) 1 gal/A at first bloom, 2) 1 gal/A at first bloom fb 1 gal/A at 5000 ppm threshold, 3) 1 gal/A at 5000 ppm threshold throughout the season, and 4) 1 gal/A at 4000 ppm threshold throughout the season. The thresholds of 5000 or 4000 ppm petiole nitrate levels were the trigger for subsequent applications. All cooperators followed a standardized petiole sampling protocol. Sampling was initiated approximately two weeks following first bloom and continued once a week throughout the season. All samples were shipped to the same lab for analysis by a Cardy Nitrate NO<sub>3</sub><sup>-</sup> Meter. Petiole readings were recorded throughout the season for all locations. The yield was measured at all locations. Quality was measured at the Somerville, TN and Clarksdale, MS locations.

The cotton petiole nitrate levels for all treatments and locations were plotted with application timings included. The nitrate analyses indicated that regardless of the treatment or location there is a rapid decline in petiole nitrate levels after the second week of flowering. As boll load increases there is a greater demand for nitrogen thus the reduction in petiole nitrate levels. The applications of CoRoN, regardless of treatment, have the effect of either restoring the petiole nitrate levels or reducing the rate of decline. The Cardy Nitrate Meter appears to be a useful tool for making field determination of petiole nitrate levels. Although two threshold levels were used in this study, data suggest that a single threshold level of 5000 ppm may have been used as the trigger.

Only the yields from treatment 1, treatment 2, and the untreated or standard are discussed. Treatments 3 and 4 were not harvested at all locations due to disease or weed problems. All locations had an untreated check except Clarksdale, MS, which had a standard application of ammonium sulfate at

100 lbs/A. The single application (treatment 1) of CoRoN resulted in yields ranging from -135 lbs lint/A to 69 lbs lint/A as compared to the check or standard. Treatment 2 resulted in yields ranging from -156 lbs lint/A to 237 lbs lint/A as compared to the check or standard. The yield averaged across locations for the treatments 1 and 2 were 894.5 and 944.1 lbs lint/A, respectively. The average for the untreated or standard was 931.5 lbs lint/A. Applications of CoRoN can have a positive impact on yield. Although quality was measured at two locations no conclusions can be drawn at this time. Further research is needed to determine the most efficient timing of CoRoN as related to petiole analysis. Also, CoRoN paired with potassium and other foliar applied nutrients need to be evaluated for their potential to positively impact yield and quality.