

**FIELD EVALUATION OF AVAIL<sup>®</sup> PHOSPHORUS FERTILIZER ENHANCER  
FOR COTTON IN THE MID-SOUTH**

**M. Wayne Ebelhar**

**Davis R. Clark**

**Mississippi State University**

**Delta Research and Extension Center**

**Stoneville, MS**

**Abstract**

AVAIL<sup>®</sup> Phosphorus Fertilizer Enhancer is described as “a unique formulation designed to minimize fixation and maximize fertilizer investment” (Specialty Fertilizer Products, Leawood, KS). The product claims to increase availability of applied phosphorus fertilizer regardless of how or when it is applied, offering growers both flexibility and added assurance of phosphorus efficiency. Phosphorus (P) nutrition has not been a major issue in cotton production on most of the alluvial soils of the Mississippi Delta where cotton has been grown. However, corn and soybean production has been extended onto traditional cotton acres. The grain crops remove two to three times more P from the field than cotton. In recent years, much interest has been generated with respect to nutrient uptake efficiency and overall nutrient efficiency. Many producers are looking at mechanisms to enhance nutrient uptake while reducing impacts on the environment from nutrients such as nitrogen (N) and P leaving the landscape. Different products have been touted in the marketplace as means of improving nutrient uptake efficiency. It has been readily recognized that the best timing of application is as close as possible to the time that it is needed by the crop being grown. A field study was established at the Tribbett Satellite Farm of the Delta Research and Extension Center to evaluate P rates and AVAIL<sup>®</sup>. The study area was comprised of Dundee and Forestdale silty clay loam (Typic Endoaqualfs). The P rates were 0, 20, 40, and 60 lb P/acre (0, 100, 200, and 300 lb CSP/acre) with and without AVAIL<sup>®</sup> (0.5 gal/ton). The P applications were made in the fall after harvest, but prior to any fall tillage (2010 was spring application). The fertilizer material was pre-weighed, then hand-applied as a broadcast to the entire plot. The eight treatments were arranged in a randomized complete block design with six replications. All cultural practices (herbicides, insecticides, cultivation, etc) were maintained uniformly throughout the growing season. After defoliation, the center two rows of each plot were harvested with a spindle picker adapted for plot harvest. Random grab samples were taken during the harvest and used to determine lint percentage and lint yield. Soil samples were taken following harvest and prior to additional P applications. All data was summarized and analyzed with SAS (Statistical Analysis Systems) with significance determined by Fisher’s Protected Least Significant Difference (LSD). Seedcotton and lint yields were determined each year with the lint percent based on the grab samples taken at harvest and ginned through a 10-saw micro-gin. Lint yields varied from year to year with good yields in 2010 and 2012, but less in 2011, due to drought. Over the three years of the study to date, there has been no significant response to P rates or to the addition of AVAIL<sup>®</sup>. Based on soil test P, it is unlikely that P additions would significantly increase lint yields. In the case of an enhancer, if there is no response to the nutrient then it is highly unlikely that an additive would create a response. The soil test does indicate a buildup of soil test P at the higher P rates and a decline in available P where no P has been applied. To better assess the effects of an enhancer, it would be better to look for a more responsive site. This report was presented as part of a workshop organized by the Soil Management and Plant Nutrition Technical Conference at the Beltwide Cotton Conference in San Antonio, TX. For more details on the study, please see:

Ebelhar, M. Wayne and Davis R. Clark. 2013. Summary of Field Evaluations of AVAIL<sup>®</sup> Phosphorus Fertilizer Enhancer for Cotton. *In* 2013 Proceedings of Beltwide Cotton Conference, San Antonio, TX. National Cotton Council of America. Memphis, TN,