

**Alabama Farmers Wheat and Feed Grain Committee**

**Title: Airborne Imagery for Rapid Crop Productivity Assessments**

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**Location: Tennessee Valley, Upper Coastal Plain**

**Summery Report For 2006**

This project was conducted on Paul Clark's farms in Decatur, Alabama. Two cornfields that are located approximately 5 miles apart were divided into three management zones, "Low", "Medium", and "High" from previous yield records. They received preplant 40 lbs/acre nitrogen as liquid urea and then sideressed with 90, 130 and 160 lbs/A of nitrogen within each management zone that was replicated at least four times. During the 2006 growing season, a total of 96 depth soil samples at 0-15, 15-30, 30-45 and 45-60 cm were collected from "Low", "Medium" and "High" management zones on 04/27/06 (before any fertilizer was applied), 07/22/06 (late in the growth) and 12/14/06 (after harvest). The soil samples were analyzed for pH, N, C, P, K, Ca, NO<sub>3</sub>-N and NH<sub>4</sub>-N. In addition, corn leaves were sampled on 06/29/06 and analyzed for C, N, K, Ca, Mg and other essential nutrients. Chlorophyll measurements were taken on 05/13/06 and 06/29/06. InTime (InTime Inc.), an imaging company, made digital images of the cornfields on May 12; June 16 and July 2, 2006.

In general, average chlorophyll measurements during both dates were arrayed as "High" zone > "Medium" zone > "Low" zone for Field S1 and "High" zone > "Low" zone > "Medium" zone for Field S5. Our data showed that the mean values of pH, P, K, Mg, Ca, N, NO<sub>3</sub>-N and C of the topsoil (0-15 cm) were significantly different ( $p=0.05$ ) from the other depths. They all decreased as soil depth increased except Mg that in general increased with increasing depth, and NO<sub>3</sub>-N that did not follow any pattern. Although the variability of many of the nutrients analyzed can be a cause for the variable corn yield observed in these fields, it was probably the sever drought that contributed to yield decrease and variability during this crop season. Low subsoil pH might also have contributed to low yield and variability in these fields. More needs to be done in image analysis, constraint identification and prescribing corrective measures on timely manner that will help to fully exploit precision farming and optimize productivity.