

## 2005 Project Report

**Title:** Evaluation of Variable-Rate Seeding for Corn

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**Objective:** To evaluate opportunities for increased yield or profits through variable-rate seeding

### Procedures:

A cooperative farmer was identified in Northern Alabama to conduct this on-farm study. This farmer utilizes a corn and corn rotation while also managing center pivot irrigation on a select portion of managed farmland. Irrigation permitted the comparison of irrigated and dryland corn production. An irrigated and non-irrigated (dryland) field were selected to conduct this research. Selected seeding rates included 22K, 25K, and 28K seeds/ac for the dryland field and 26K, 30K, and 34K seeds/ac for the irrigated field. These seeding rates were established based on the farmer's traditional seeding rates for the particular corn varieties and recommendations from consultants from the respective seed company. Additional seeding rates were selected above and below the traditional seeding rate.

A 24-row planter equipped with a VR drive system was used to plant the plots. The planter was calibrated based on the manufacturer's operators manual. The plot within each field was blocked to provide 4 replications for each of the corn treatments. Treatments were then randomly assigned within each block with a single pass of the planter representing a specific population treatment within the block.

Subsequent to planting, stand counts were measured to determine the actual germinated population. These were collected by measuring the number of plants for two adjacent rows over a 10-ft length. Count measurements were gathered on each 12-row section of the planter, collecting counts at 3 places along each 12 rows. A combine equipped with an AgLeader yield monitor was used to obtain spatial performance data for the plots. Analyses included summarizing stand counts along with spatially segregating yields based on the various seeding treatments to determine the effect of seeding rate on corn yields. All statistical analyses were conducted at a significance level of 0.05.

### Results:

Results from the stand counts indicated that populations were higher than the target rate in several plots. This result indicates that the planter calibration will need to be evaluated carefully during 2006 to ensure that the appropriate seed amount is distributed. Growth conditions were good in the spring which may have contributed to higher-than-expected plant germination and emergence. Analyses indicated no significant difference in corn yields between the 3 seeding treatments for either the dryland or irrigated plots (Tables 1 and 2). However, there was a significant difference found between irrigated and dryland corn with irrigated corn yields around 55 bu/ac or about 38% higher than dryland yields.

It should be noted that results represent only the first year of this study and could differ in subsequent years. Plans are to continue this investigation during the 2006 and 2007 growing seasons.

**Table 1. Field 1 summary for dryland corn.**

| <b>Treatment<br/>(Population - Seeds/ac)</b> | <b>Actual Population<br/>(Seeds/ac)</b> | <b>Yield (bu/ac)</b> |
|--|---|----------------------|
| 22,000                                       | 23,377                                  | 150.9a               |
| 25,000                                       | 26,354                                  | 147.3a               |
| 28,000                                       | 28,241                                  | 150.0a               |

**Table 2. Field 2 summary for irrigated corn.**

| <b>Treatment (Population -<br/>Seeds/ac)</b> | <b>Actual Population<br/>(Seeds/ac)</b> | <b>Yield (bu/ac)</b> |
|--|---|----------------------|
| 26,000                                       | 27,690                                  | 205.4b               |
| 30,000                                       | 30,886                                  | 209.9b               |
| 34,000                                       | 33,570                                  | 206.9b               |