

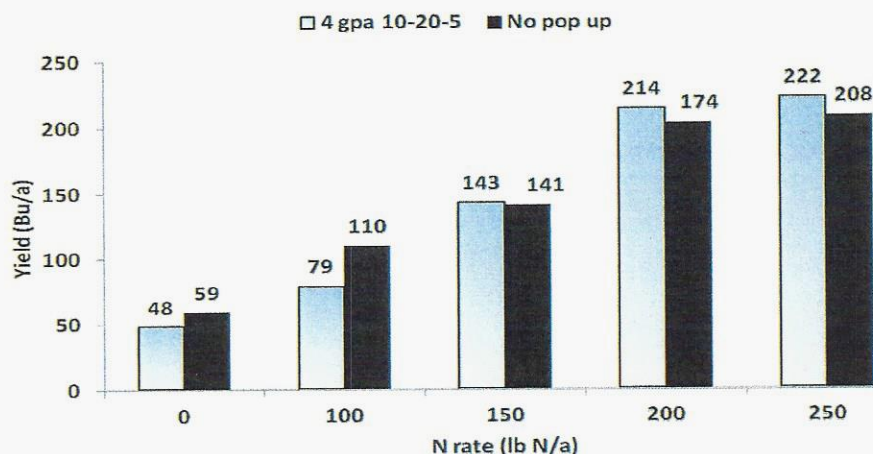
## ARKANSAS CORN AND GRAIN SORGHUM REPORT 2014

**Title:** Optimizing Soil Fertility Requirements for Corn  
**PI:** Leo Espinoza, Soils Specialist, University of Arkansas  
**Goal:** Increase Nitrogen Fertilizer Use Efficiency in Corn

### Objectives:

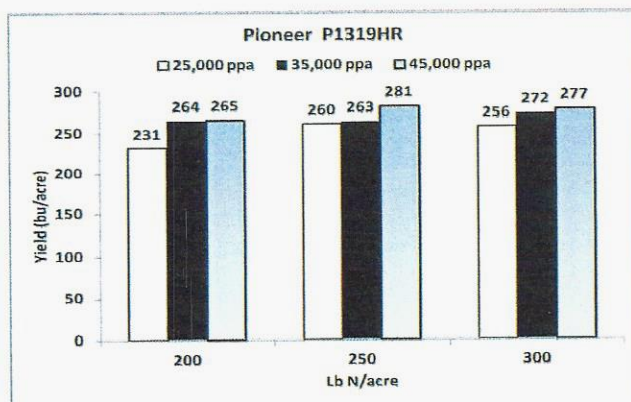
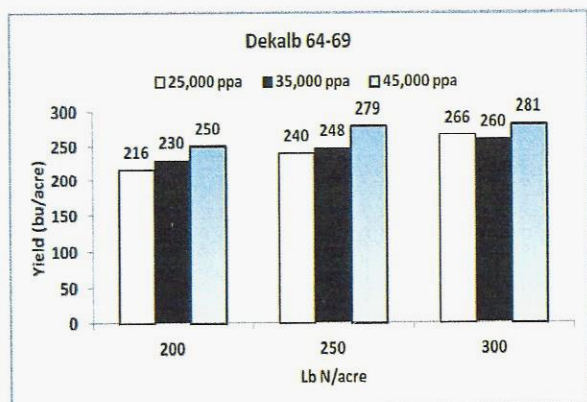
1. To assess the use of pop-up fertilizers (liquid fertilizer with the seed) as a way to increase nitrogen use efficiency and seedling vigor.

Plots were planted at the Cotton Branch Station, with treatments including 4 gpa of a 10-20-5 liquid fertilizer applied with the seed. There was an obvious difference in seedling vigor between treated and untreated strips, regardless of nitrogen rate treatment. Yields



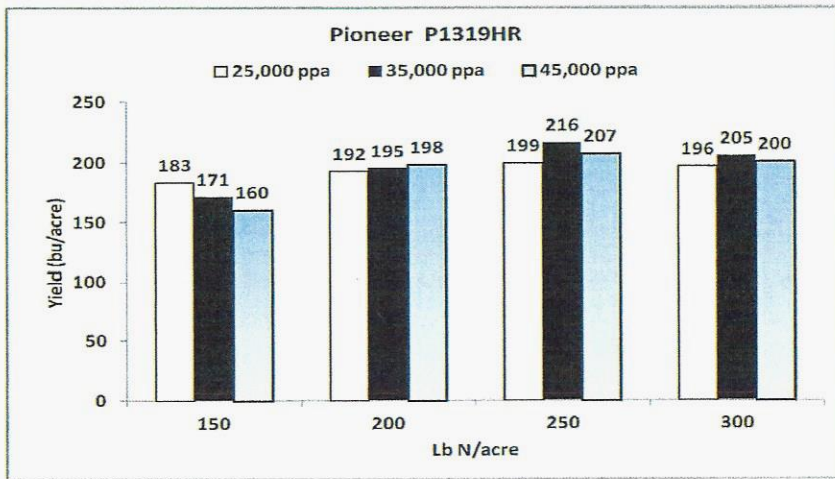
were maximized between 200-250 lb/acre 240 lb, regardless of in-furrow treatment. There was a significant yield increase observed when using the pop fertilizer, especially at the rates needed to maximize yield potential. However, this trend was not statistically different due to significant variability among treatments. We noticed that treatments that had received in-furrow fertilizer reached the VT stage 3-4 days earlier than the untreated plots.

2. To study the interaction of seeding rate and nitrogen needs for selected hybrids.



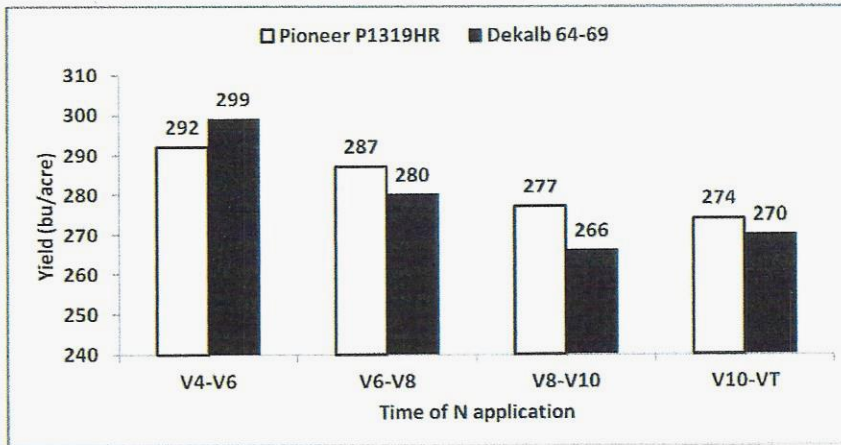
The above graphs show yields from SEREC near Rohwer. Corn intended population was 25,000, 35,000 and 45,000 plants per acre, with N rates being 200, 250, and 300 lb/acre. Plots consisted of 4 rows wide by 25 ft long, and replicated 4-5 times. There was a trend for increasing yields with higher populations, but data showed no need for increased nitrogen rates above current recommendations.

The plots in Central Arkansas (Lon Mann) were established in a soil mapped as a silt loam. There was no interaction between fertilizer rates and plant density.



**3. To study the implications of delayed nitrogen applications in corn yields.**

Plots consisted of 4 rows wide by 25 ft long, and replicated 4-5 times. A single 250lb/a rate was applied to each plot. Treatments consist of an application of 100 lb N/a at emergence, with applications of the remainder N done at V4-V6, V6-V8, V8-V10, and V10-VT.



The figures show the yield results from the Rohwer station. Delaying the sidedress N application beyond the V 8 can result in significant yield loss.

**4. To study the potential benefit of a biomass sensor in Grain Sorghum (US Checkoff Program).**

Sorghum was planted at the Lon Mann Station where soybean had previously been grown. A blanket application of 60 lb N/acre was applied at the V3 stage. Sensor readings were collected. Such readings showed that the plant had enough nitrogen to maximize yield potential. Additional increments of 30 lb N/acre were applied two weeks later with no significant yield increase observed.

