

Arkansas Soybean Research Promotion Board 2007 Annual Report

Project Title: Phosphorus and Potassium Fertilization of Soybean
Project Leader: Nathan Slaton - Associate Professor/Director of Soil Testing

Objectives:

1. Evaluate soybean yield response to P fertilization rate,
2. Evaluate soybean yield response to K fertilization rate,
3. Update University of Arkansas P and K fertilizer recommendations if appropriate.

Results:

Research trials were established at six sites to evaluate soybean yield response to phosphorus (P) and potassium (K) fertilization in the spring of 2007 with sites including grower and Agricultural Experiment Station fields. Two additional research trials were established to evaluate poultry litter as a P and K fertilizer source. Separate, but adjacent tests, were established for each nutrient. Five P or K rates ranging from 0 to 160 lbs P₂O₅ or K₂O/acre were applied shortly before/after planting. The long-term K rate test at Pine Tree was also continued in 2006. After 3-years, 27 K rate trials and 21 P rate trials have been conducted over the last 3 years. Test results have been published in the Wayne E. Sabbe Soil Fertility Series each year and a summary of the K data was published in Better Crops (V91:28-30) in summer of 2007. A full report of data collected during 2007 will be published in the next issue of Arkansas Soil Fertility Studies.

The two figures (below) show the percent relative of soybean grown on silt loam soils receiving no P or K fertilizer compared to soybean receiving P or K. In general, relative yields <90-95% indicate a significant response to fertilization (indicated by filled circles). Soil-test K is an excellent predictor of whether soybean yields will respond to K fertilization, but soil-test P requires additional research to delineate accurate soil-test based P fertilizer recommendations. Soils with soil-test P <20 ppm appear to respond favorably, albeit inconsistently to P fertilization.

