

Investigating Precision Ag Practices for Site-Specific Nutrient Management in Peanuts

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Objective 1: To evaluate the effect of uniform lime application in a field with varying soil pH on peanut growth and yield with a goal of demonstrating the benefits of precision soil sampling and VR applications

Summary: A 37.5 acre grower field was selected for this study in Tifton, GA. Soil samples were taken using 2.5-ac grids to determine spatial soil pH variability in the field. Grower, based on his traditional soil sampling results, applied 0.5 ton/ac uniformly across the whole field whereas the areas with low soil pH, zone 2 and zone 3, called for 1.0 and 1.5 ton/ac, respectively. Tissue samples, visual crop assessment and yield were collected in all three soil pH zones. Data tables provided below presents a comparison between uniform and variable-rate lime application for this field. Results showed low plant nutrient levels, crop growth and reduced peanut yield (1,262 and 4,577 lbs/ac) in low soil pH zones (zone 2 and 3, respectively). Comparative analysis indicated that using precision soil sampling and variable-rate lime application can increase the revenue by \$37/ac in this field, which can easily pay off the additional cost of grid sampling (\$6.5/ac) and the additional lime (\$4/ac) required to address soil pH variability.



----- Uniform Application -----					
Field	Size (acres)	Rate (tons/ac)	Cost (\$/ac)	Yield (lbs/ac)	Gross Rev. (\$/ac)
Zone 1	30.5	0.5	\$19	6,478	\$1,376
Zone 2	6.2	0.5	\$19	5,216	\$1,108
Zone 3	0.8	0.5	\$19	1,901	\$404

----- Variable-Rate Application -----					
Field	Size (acres)	Rate (tons/ac)	Cost (\$/ac)	Yield* (lbs/ac)	Gross Rev. (\$/ac)
Zone 1	30.5	0.5	\$19	6,478	\$1,376
Zone 2	6.2	1.0	\$38	6,000	\$1,275
Zone 3	0.8	1.5	\$57	4,000	\$850

Average/ac

\$19 6,171 \$1311

Average/ac

\$23 6,346 \$1348

Objective 2: Assess the application accuracy and distribution uniformity of gypsum across the spread width as well as within the field when applied with a dual spinner-disc spreader.

Summary: A large-scale peanut field at the Southwest Research and Education Center in Plains, GA was used for this study. Collection pans were placed along the spread swath at three different positions (approx. 100 ft. apart) and gypsum applications were made at different spreader settings (flow divider position 1", 4" and 7"; 4" was nominal setting used by the farm manager) to assess the application accuracy and distribution uniformity across the swath. Results showed that actual application rate varied between the spreader settings and was 7% to 35% greater than the target application rate (900 lbs/ac). Similarly, gypsum application was highly non-uniform (CV = 38% - 70%) across the swath with a large center peak behind the spreader for all three settings. Proper spreader calibration to ensure accurate application rate and uniform distribution is highly recommended, especially for seed growers .

