

THE INFLUENCE OF VARIABLY APPLIED POTASSIUM FERTILIZER ON YIELD VARIATIONS IN TWO SOUTHERN ILLINOIS FARM FIELDS

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Abstract

The basis of Variable Rate Technology (VRT) is to apply nutrients where they are needed and to reduce the application of nutrients where they are not needed. However, there is considerable uncertainty as to whether the variable application of nutrients to farmers fields should be on the basis of soil test levels or yield potentials. A field study was conducted at two locations in southern Illinois from 1997 to 1999 to evaluate VRT as a management tool for corn and soybean production on fields with highly variable soil test levels, depths to clay layer, topography, water holding capacity, electromagnetic inductance, and electrical conductivity. The fields were divided into 0.45 acre grids and ten grid cells were chosen at each location for detailed study with variable potassium (K) rates. Cells were chosen to produce a variety of soil test K levels and depth to clay layer. Soil and plant nutrient levels and grain yields were determined at each cell location. The average soil test K levels at the Jefferson and Pope county locations were 142 pounds per acre (with a range from 82 to 178 pounds per acre) and 144 pounds per acre (with a range from 88 to 262 pounds per acre), respectively. Increasing K rates within gridded cells nearly always increased K uptake by the plants, but had little impact on grain yields. Factors other than soil test K levels are necessary for quantifying K responses.

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