Managing Potassium and Phosphorus Soil Test Levels in a Rice-Soybean Rotation

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Abstract

A long-term rice-soybean (*Oryza sativa*, L., *Glycine max*, L.) rotation was conducted at Glennonville, Missouri to determine how quickly farmers need to increase soil test levels in low phosphorus (P) and potassium (K) fertility fields. Plots received P and K fertilizer to increase soil Bray-1 P and ammonium acetate extractable K in one, four, or eight year buildup programs. In most years, soybean and rice yields from plots receiving P and K fertilizer treatments were significantly greater than yields from untreated controls. Two soil test P and K target levels were tested. The soil test target for rice using University of Missouri recommendations was 22% lower for P and 36% lower for K than the soybean target. No justification was found for recommending lower soil test P and K target levels for rice than soybean. Averaged across buildup programs, rice produced significantly greater yields using the soybean P and K soil targets than the rice P and K targets. Averaged over years, soybean and rice yields were not affected by the length of time in P and K buildup programs. Farmers can prolong buildup of soil test P and K over four to eight years without yield losses.

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