Mehlich-3 Phosphorus Response to Phosphorus Fertilization in a Soybean-Rice Rotation. (S08-slaton210249-Poster)

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Abstract:

In Arkansas, soils used for rice production typically have low soil test P even though P fertilizer is routinely applied to all crops grown in the rotation. Farmers perceive the low soil P as a direct result of inadequate P fertilizer recommendations. The objective of this study was to monitor soil Mehlich 3 P (M3P) response across time to crop rotation and P fertilizer rate. Five annual P fertilizer rates (0 -58.6 kg P/ha) were broadcast each year (1998-2001) before seeding soybean or rice in two crop rotations (continuous rice, CR; soybean-rice, SR). Soil samples were taken in February each year and extracted with Mehlich 3. The study was conducted on a DeWitt (pH 6.0) and a Calloway silt loam (pH 8.0). The absolute difference in M3P between consecutive years was calculated. Data was analyzed by location as a split-split plot design. The 3-way interaction between rotation x P rate x year was significant ($P<0.10$) for both locations. For the SR rotation M3P tended to decrease following rice and increase following soybean for all P rates. The magnitude of change tended to increase as annual P rate increased. Regardless of P rate, M3P remained relatively constant among years for the CR rotation. Flooding depresses M3P even when P rates in excess of crop removal are applied.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 2227

Keywords:

Soil test phosphorus, Crop rotation, Rice and soybean, Phosphorus fertilization