Comparison of soil-phosphorus tests for rice and differences between Bray-2 and Mehlich-3 soil-P tests. (S04-bell133538-Poster)

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Abstract:

Phosphorus chemistry in rice soils is complex and the development of soils tests for estimating fertilizer needs difficult. Soil-P tests used in AR (Mehlich-3) and LA (Bray-2) are inaccurate for some rice soils. We examined soil-P test failures and compared Bray-2 soil-P with common Mehlich-3. We will present results from a greenhouse study evaluating the most common soil-P tests for rice from soils of LA, CA, and TX. Bray-2 soil-P levels from a central Louisiana rice soil where leaf-P levels were borderline deficient and P deficiency in rice had occurred averaged 130 mg P/kg Bray-2 or 62% > the critical value for requiring P. Mehlich-3 values averaged 6 mg/kg or 60% <the AR critical value. Limited data indicated fertilizer recommendations disagreed from soils with pH > 7.6. Bray-2 may remove non-phytoavailable P from calcareous soils and Mehlich-3 may underestimate phytoavailable P from high Ca or calcareous soils. The pH of the Mehlich-3 extractant increased from 2.5 to 3.6 when analyzing the calcareous soils but no drop from a pH 6 soil.. Geochem-PC calculations estimated 80% of Mehlich-3 fluoride from ammonium fluoride precipitated in soils with high exchangeable Ca and Mg vs 16% from low Ca and Mg soils.

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