Liquid Swine Manure Phosphorus Utilization in Corn-Soybean Rotations. (S08-mallarino082624-Poster)

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Abstract:

This study evaluated fertilizer and manure P bioavailability by soil testing and plant analysis in Iowa corn and soybean fields. Treatments were liquid swine manure (zero, one, and two times the expected P removal in grain) applied to long strips, and four P fertilizer rates (0-30 kg P/ha) applied to small plots superimposed onto each strip. Fertilizer N was uniformly applied across the corn small plots. Measurements were early plant growth and P uptake (V5 growth stage), grain yield, and P removed with grain. Agronomic soil tests (Bray-P1, Olsen, and Mehlich-3) and environmental soil tests (Fe-oxide impregnated paper, and water extraction) were highly correlated across manured and fertilized soils (r 0.95 to 0.99). Soil tests generally detected a similar relative soil-P increase due to manure or fertilizer application. Phosphorus fertilization, in addition to manure application, did not increase grain yield. Early growth, plant P uptake, and P removal in grain usually responded to both manure and fertilizer P, even in soils testing high in P. Phosphorus fertilization is not needed after applying liquid swine manure based on its total P content and on expected crop removal.

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