Comparison of Phosphorus and Nitrogen From Raw and Anaerobically Digested Swine Manure. (S04-sawyer150316-Poster)

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Abstract:

The processing of swine manure in an anaerobic digester for biogas production is not a complete waste-treatment process, with the digested material containing crop nutrients. Our objective was to compare the impact of anaerobically digested swine manure and raw manure on changes in soil test P (STP) and inorganic-N in a 112-day soil incubation study. Treatments were a factorial combination of raw swine manure, digested swine manure, and inorganic fertilizer each applied at five rates (for P: 0, 12.5, 25, 37.5, 50 mg total-P per kg and for N: 0, 50, 100, 150, 200 mg total-N per kg). Raw and digested manure produced the same change in STP, soil pH, ammonium-N disappearance, and nitrate formation. Within 28 d of application change in STP was less with manure sources than fertilizer-P. As estimated by change in STP, the Olsen-P, Bray 1-P, and Mehlich 3-P tests estimated similar P recovery at the end of the incubation from both manure sources (approximately 15 to 30%), but this was somewhat lower than from fertilizer P (approximately 30 to 40%). The conversion of ammonium to nitrate occurred at essentially the same rate for both manure sources and fertilizer, however, nitrate production was approximately 20% less with both manure sources compared to fertilizer. These results indicate that digested swine manure can readily supply crop available N and P and producers should agronomically manage it as they would raw swine manure.

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