Transformation of Dairy Manure Nitrogen Fractions to Plant Available Forms. (S08-griffin125552-Poster)

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Abstract:

Differences in the inorganic nitrogen (N) and soluble organic N (SON) content of dairy manures continue to make prediction of plant available N (PAN) difficult. A 150 d incubation experiment examined the changes in soil N following application of 11 different dairy manures, containing a wide range of ammonium (NH4-N) and soluble organic N. Manures were applied to moist soil at a rate equivalent to 100 mg organic N/kg soil, and soil NH4 and nitrate (NO3) concentration were determined 0, 3, 7, 14, 28, 56, 108, and 150 d after application. Soil moisture was maintained at 80% water-filled pore space, and samples were stirred and repacked at each sampling date. For manures containing significant NH4, the dominant N transformation was nitrification, indicated by accumulation of NO3 over time. As expected, manures containing higher amounts of carbon (as bedding) either immobilized N in the short-term, or exhibited no net nitrification or immobilization. The amount of NO3 accumulated during the course of the incubation was most strongly related to the amount of NH4 applied. There was little indication that significant net mineralization of manure SON or of more recalcitrant organic N fractions occurred over the 150 d period, even though the conditions were optimal for mineralization.

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