Sequestering Manure N with Synthetic Zeolites. (S08-stout084740-Poster)

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Abstract:

Natural zeolites have long and successful history of agricultural use in Japan and more recently the U.S. However the price (often > 500 US dollars per tonne) limits their use in agriculture. Zeolites can be synthesized from fly ash by reaction with sodium hydroxide solutions. The projected costs of synthetic zeolites is about 50 US dollars per tonne. Such zeolites are able to adsorb liquids and gasses, and take part in cation exchange. Thus, they have the potential to sequester manure N. The objectives were to determine: 1) the ability of zeolites synthesized from flyashes to adsorb ammonium from manure, and 2) the plant uptake of N in the ammonium absorbed by zeolites. Zeolites were synthesized by boiling Class F and C flyashes in near stoichiometric amounts of NaOH. Class F ashes tended to produce Na-P1 zeolite and Class C ashes tended to produce mixtures of tobermorite and hydroxysodalite. Class F zeolites outperformed the Class C zeolites in absorbing ammonium. Acid neutralizing improved ammonium absorbtion by the zeolites. Plant data will also be presented.

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