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### Assesment of Ammonia Volatility from Fall Surface-Applied Liquid Dairy Manure

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Abstract

Ammonia emissions from dairy and livestock operations are of significant environmental and human health concern in the United States.

Conservation of ammonia from fall surface-applied manure could benefit

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farmers by retaining nitrogen for use by crops in the spring growing season. The primary goal of this research was to investigate a management strategy for mitigating ammonia volatility from cow manure at the time of field application with no incorporation in the fall before snow fall. The hypothesis is that application of manure in cooler fall temperatures will slow the rate of ammonia volatilization. The objective was achieved by measuring temperature and rates of ammonia volatility from surface-applied liquid dairy manure every month over a period of four months from September to December, 2008. Manure was surface-applied to a field cover-cropped with winter rye (*Secale cereale* L.) in September. Ammonia emissions were measured using a dynamic chamber method. Colder temperatures significantly reduced rates of volatility and amounts of nitrate found in the soil. However, N-accumulation in the cover crop fluctuated and was not significantly different from month to month. The greatest spring nitrogen retention and lowest rates of ammonia volatility in the fall were from December plots. Surface application of liquid dairy manure should be conducted as late as possible in the fall before snow fall for the least amount of nitrogen loss due to ammonia volatilization. Planting a cover crop at the time of fall harvest in conjunction with a late fall (November or December) manure application is a nutrient management strategy which deserves further investigation.

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