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Manure application method affects ammonia and greenhouse gases

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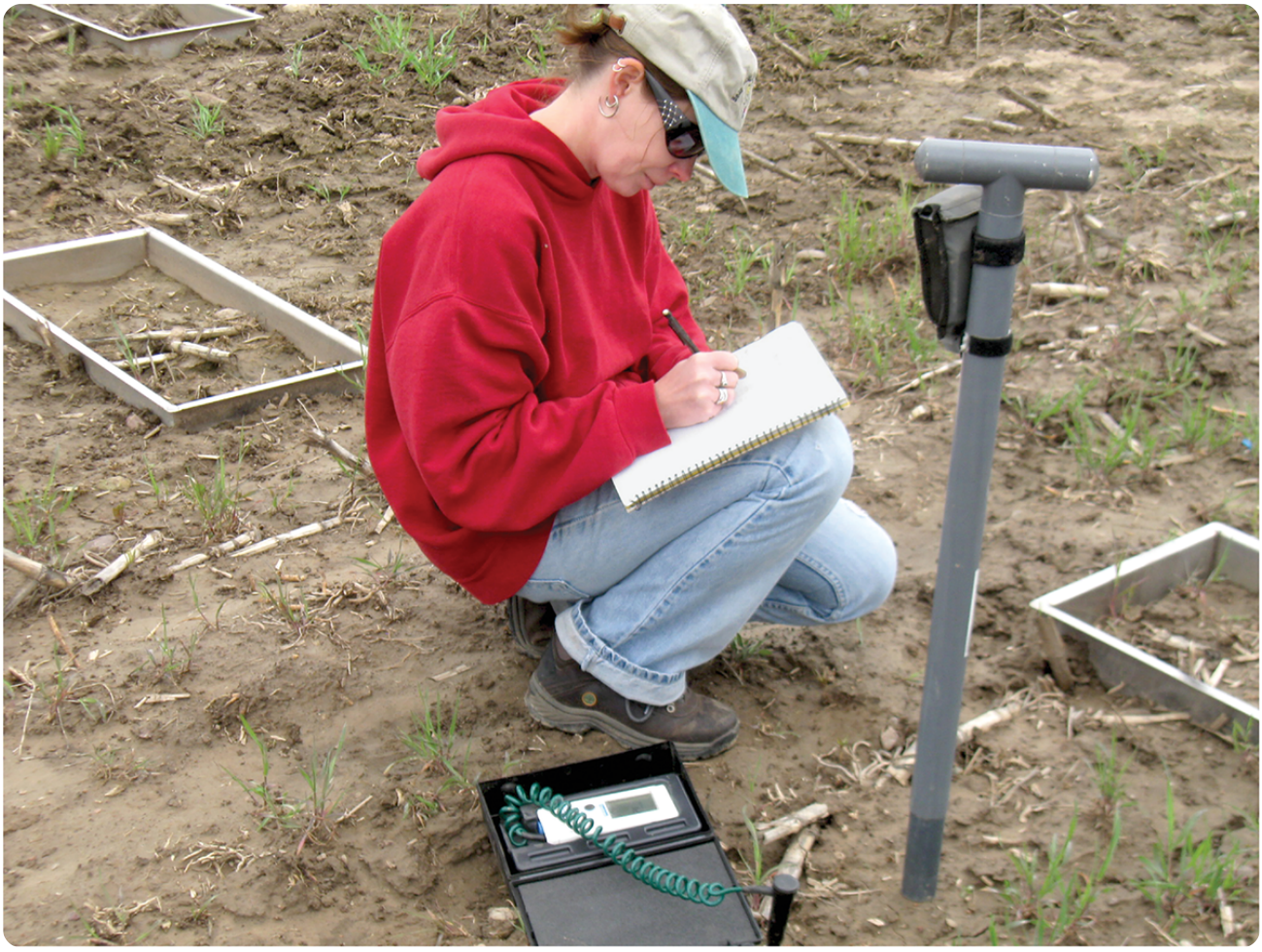

Jessica Sherman taking notes in the research field plots. Photo by William Jokela.

Manure and fertilizer applications contribute to greenhouse gas (GHG) and ammonia emissions. Ammonia nitrogen (N) and nitrous oxide losses are an economic loss of N to farms and contribute to global GHG fluxes. Few studies have examined the effects of low-disturbance manure incorporation (LDMI) on both ammonia and GHG fluxes.

New *Journal of Environmental Quality* research compared ammonia and GHG fluxes in corn–winter rye plots for LDMI, surface-broadcast, broadcast/disk incorporation, and spring-applied urea treatments. Broadcast application lost about one-third of applied ammonium-N as ammonia while strip-till inject and coulter inject lost less than 5%. Mean nitrous oxide loss was greater for LDMI treatments compared with broadcast but lower than urea. Manure treatments had greater mean carbon dioxide fluxes with larger total GHG emissions compared with urea.

While LDMI increased nitrous oxide flux, it is also important to consider environmental and economic benefits associated with a 95% reduction in ammonia emissions with strip-till inject and coulter inject. Considering LDMI can dramatically mitigate ammonia loss from manure application and LDMI also substantially reduces runoff nutrient loss potential, both economic and environmental trade-offs for LDMI should be considered in forage cropping systems.

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Sherman, J.F., Young, E.O., Jokela, W.E., & Cavadini, J. (2021). Impacts of low-disturbance dairy manure incorporation on ammonia and greenhouse gas fluxes in a corn silage–winter rye cover crop system. *Journal of Environmental Quality*. **https://doi.org/10.1002/jeq2.20228**

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