

# Changes in Available Soil Nitrogen Over Two Years Following Liquid Hog Manure Application to Range and Pasture

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Application of liquid hog manure (LHM) to pasture and rangeland can be an effective disposal method of manure, while simultaneously adding available-N to grazing lands. The objectives of the study were to: (1) assess the effect of manure application rate on 4 pastures; (2) compare the effects of subsurface injection and surface broadcast LHM; and (3) examine how application method affected depth of available soil-N ( $\text{NO}_3^-$  and  $\text{NH}_4^+$ ). LHM applications took place in October 1998 and April 1999 on 4 sites between Hanna and Drumheller, Alberta, in the Little Fish Lake area. The study consisted of 2 native sites (Fescue and Mixed Prairie) and 2 tame sites (Bromegrass-Alfalfa and Crested Wheatgrass). Sites were soil sampled in April 1999 after LHM application but before plant growth, and again in April 2000, one growing season later.

Following application, available soil-N increased linearly ( $p < 0.001$ ) at all rates of LHM application (10, 20, 40, 80, 160  $\text{kg}\cdot\text{ha}^{-1}\text{-NH}_3$ ), with no carryover one growing season later. Soil nitrate was highest on the two tame sites in 1999 following application. Nitrate was also greater on injected rather than broadcast treatments, but was limited to the surface 20 cm of soil in 1999 ( $p < 0.01$ ). This effect also carried over to the following growing season (2000). Differences in nitrate were not observed at depths below 20 cm.

## Implications

The results of this study may assist producers to reduce nitrogen losses and help select optimal manure disposal options in areas where the management of native range and tame pasture coincides with hog production.