

Manure Application on Forages in Southern Alberta

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Many factors are considered when selecting manure management options. One option is to apply manure on forages. However, there is limited research on the effects of manure application on forage land in Alberta. The objective of our five-year field study was to determine the effects of repeated, annual applications of hog and beef cattle manure on soil quality, forage yield, and forage quality.

Two field sites were used: one started in 1996 near Lethbridge under irrigated alfalfa, and the second started in 1997 near Airdrie under rainfed timothy grass. The experimental design included two annual manure application times (spring and fall), two manure types and application methods (surface-applied solid cattle manure and injected liquid hog manure), and five application rates (0, 31, 61, 92, and 122 tonne/ha for the solid manure, and 0, 42, 84, 126, and 168 tonne/ha for the liquid manure; all on a wet-weight basis).

Application time generally did not affect soil chemical parameters. There was greater accumulation of soil nitrate-N when hog manure was applied to the timothy plot compared to application of cattle manure. Greater levels of potassium accumulated from application of cattle manure than from hog manure. Soil nitrate-N, phosphate-P, sodium, and potassium increased with manure application rate. Application time and manure type had no significant effect on alfalfa or timothy grass yield. In 1999 and 2000 (alfalfa) and 1998 to 2000 (timothy grass), yield increased with manure application rate. Manure application also affected some forage quality parameters.

Implications

Manure application on forage is feasible, but nutrient management plans need to be implemented, including the monitoring of soil quality.