

**Title:** Impact of Timing and Rate of Dairy Manure Applications on Forage Yields, Nutrient Removal and Losses

**Principal Researcher:** Dr. Ivan O'Halloran, Ridgetown College, University of Guelph

**Project Objectives:**

To examine the impact of rate and timing of dairy manure applications on the yield and nutrient content (N, P and K) of an alfalfa/grass forage crop. Estimates of potential N losses will be made using changes in profile N concentrations.

**Project Description:**

Although reasonable estimates of nutrient removal by forage crops in Ontario are available, questions remain as to a forage crop's utilization and the losses of nutrients (primarily nitrogen) from late summer applications of manures. There are also questions as to the impact of manure applications to an established forage crop in terms of both yield and stand characteristics (i.e. legume/grass ratio). The proposed study will be conducted for two years on three sites (Guelph/Elora and Ridgetown areas) on established forage stands and will include the following treatments:

- 1) Control (with no manure applied)
- 2) 3000 gallons/acre of liquid dairy manure applied after 1<sup>st</sup> cut
- 3) 3000 gallons/acre of liquid dairy manure applied after 3<sup>rd</sup> cut
- 4) 6000 gallons/acre of liquid dairy manure applied after 1<sup>st</sup> cut
- 5) 6000 gallons/acre of liquid dairy manure applied after 3<sup>rd</sup> cut
- 6) 6000 gallons of liquid dairy manure (3000 gallons/acre applied after 1<sup>st</sup> and 2<sup>nd</sup> cut)

Each site will have 3-4 replications (depending upon field sizes and uniformity of stand). Manure analyses will be conducted to monitor levels of nutrients being applied to the crop. Soil samples (0-15 cm) will be taken for P and K analysis prior to manure applications in 2003 and 2004 from each plot. Soil profile nitrogen levels (0-75 cm) will be measured two times each year (in early spring prior to the first manure application, and after the final manure application). These samples should allow for an assessment of changes in soil N status throughout the year and indicate those treatments that reduce the risk of nitrate losses. Plant yields and nutrient analysis will be determined after every cut to allow for the calculation of crop nutrient removal. For each plot, forage composition will be determined in 2003 prior to treatment applications and reassessed at the end of the experiment in 2004.

Depending upon the timing of the 3<sup>rd</sup> cut it may be possible to have a final report mostly completed by September 2004.