0035 **-** Multi-year application of whole and separated dairy slurry on perennial grass using surface banding: agronomic assessment

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Few studies have assessed the long term effects of best management practices for using manure. The benefits of using the liquid fraction of separated slurry manure in terms of improved infiltration and reduced gaseous ammonia loss are quite well known. Also, the separated liquid fractions have higher N:P ratios than whole manures, which is beneficial for matching crop requirements. While separation techniques are often costly, partial separation can be done cheaply by letting the solids settle and decanting the supernatant liquid. This 5-year study evaluates the effect of decanted and whole dairy liquids on yield and N recovery by tall fescue (Festuca arundinacea Schreb.). The manures were applied with low emission surface banding technique.

The ongoing experiment was conducted on a stand of tall fescue grass established in 2002. The manure was obtained from local dairy farms (free stall barns with wood chip bedding). The separated manure was collected from a secondary lagoon receiving the supernatant from a settling lagoon. The manure was applied to the grass in 4 equal doses totalling 443 and 637 kg N $ha^{-1}yr^{-1}$ for whole manure and 482 and 645 kg N ha^{-1} yr^{-1} for the decanted liquid fraction. Whole and decanted slurries contained 6.6 and 1.8% dry matter, respectively.

The results of this trial show that at similar rates of applied available (ammoniacal) N (306 kg N ha yr^{-1}), yield was significantly higher ($P<0.05$) from the decanted manure than from the whole manure (10.1 vs. 8.9 Mg $ha^{-1}yr^{-1}$) despite lower rates of total N applied in the decanted treatment (482 vs. 637 kg N $ha^{-1}yr^{-1}$). Also, the annual N uptake was 43 kg N ha^{-1} more from the decanted liquid than from the whole manure. Comparing at similar rates of applied total N (ammoniacal plus organic), the separated liquid treatment had 50% recovery of applied total N compared to only 39% for the whole manure. Better response to the decanted fraction than the whole manure is probably related both to lower amounts of slowly available organic N and to lower emissions of ammonia. This trial shows the benefits of using the separated liquid produced from simple decanting of cattle slurry as an N source for grass even when applied for several years with low emission surface banding technology. Data will be presented on P loadings and N_2O emissions.