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ENVIRONMENTAL IMPACT AND MANURIAL VALUE OF THE SOLID FRACTION FROM SLURRY SEPARATION

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Regions of dense livestock production are increasing world-wide. A major problem connected to these regions is that the livestock manure produced leads to oversupply of nutrients to ecosystems or agricultural land. The problems of dense livestock production can be reduced by slurry separation technology, which separates the slurry into a watery fraction with a low nutrient content and a much smaller solid fraction with a high content of nutrient and dry matter. The solid fraction can be transported to regions with a demand for plant nutrients, however, this requires that the value of the material is known and that it can be used without risk of pathogen infection.

The solid fraction is usually aerobically stored before it is used as an organic fertiliser in plant production. During this storage, a composting process takes place that increases temperature and pH. This may kill pathogens in the solid fraction, but simultaneously it increases the potential for ammonia emission and thereby loss of nutrients. The composting process will also locally and temporary deplete the oxygen content in the composting material, which may create anoxic condition facilitating production of the green house gasses, methane and nitrous oxide. Thus, storage of the solid fraction may cause environmental impact and loss of plant nutrients. A research was therefore put up to study the environmental impact and manurial value of the solid fraction arising from slurry separation.

AIMS

- Investigation of sanitation effects of composting on patogenetic micro organisms
- Estimation the volatilisation of ammonia, nitrous oxide and methane during storage
- Estimation of manurial value of the solid fraction before and after storage.

MATERIAL AND METHODS

Two tonnes of freshly separated solid fraction was placed in a ventilated airtight composting chamber. Sub samples of the heap was taken out and analysed for nutrient content and nets containing a known content of micro-organisms were placed in well defined distances from the surface, together with instruments for measuring temperature and oxygen content. The nets were taken out and analysed for content of micro-organisms when the composting temperature started to decline. The composting chamber was left untreated for three month. During the storage period inflow and outflow of ammonium, nitrous oxide and methane from the composting chamber, and development of concentration of O_2, CO_2, CH_4 and N_2O and temperature in the heap were continuously

measured. After the storage period, the mass of the composted material was estimated and the content of nutrient was estimated by analyses of sub samples.

RESULTS

The study is still running, but results will be ready before the RAMIAN conference.