AMPC

SNAPSHOT

AUSTRALIAN MEAT PROCESSOR CORPORATION

Project Title: Organic waste management at abattoirs

Project Report Reference: Project 1 in a portfolio of projects contained in 2016.1010

Date: 13 June 2016

Project Description:

The focus of this project was to assess the requirements to treat, store, or otherwise transform paunch into a useable product for on farm use. The aims of the project were twofold: i) to validate the criteria for paunch stabilization and ii) to determine the application rates for on farm use.

Project Content:

This work comprised three sets of interconnected experiments, which were conducted under controlled conditions of temperature and soil moisture both in the laboratory and glasshouse. Samples of paunch of varying ages [fresh (2-4 weeks), semi-composted (6 weeks) and fully composted (12-16 weeks)] were sourced from two abattoirs. The results provided important information regarding (1) risk of germination, (2) agronomic performance and (3) nutrient release characteristics of various aged paunch.

Project Outcomes

- **Germination risk:** The number of plantules germinated after three weeks reported a value of zero in all daily observations and treatments. This suggested low (or no) risk of weed contamination in soil amended with paunch whether fresh or at varying degrees of composting.
- **Stabilisation period:** Under the experimental conditions of this study, the six week-old compost showed relatively higher agronomic performance compared with all other paunch types (Figure 1a and 1b). Thus, a six-week stabilisation period may be suggested as reference for paunch, and may be used as guidance until further studies are undertaken.
- **Application rates:** The experimental work suggested no agronomic benefit when paunch-N application rate was increased from 150 to 300 kg per ha (Figure 1a). Above that rate, paunch nitrogen use-efficiency (NUE) decreased significantly. Therefore, a preliminary recommendation is made for land application rates in grass crops not to exceed 150 kg per of paunch-N. This recommendation requires validation under field conditions, and for a wider spectrum of crop and soil types than that used in this study. The following results for NUE (relative to urea-NUE) (Figure 1b) were recorded:
    - Fresh paunch (<4 weeks): between 20-25%
    - Semi-composted (6 weeks): 40%
    - Fully composted (12-16 weeks): between 15-40% (depending on source).

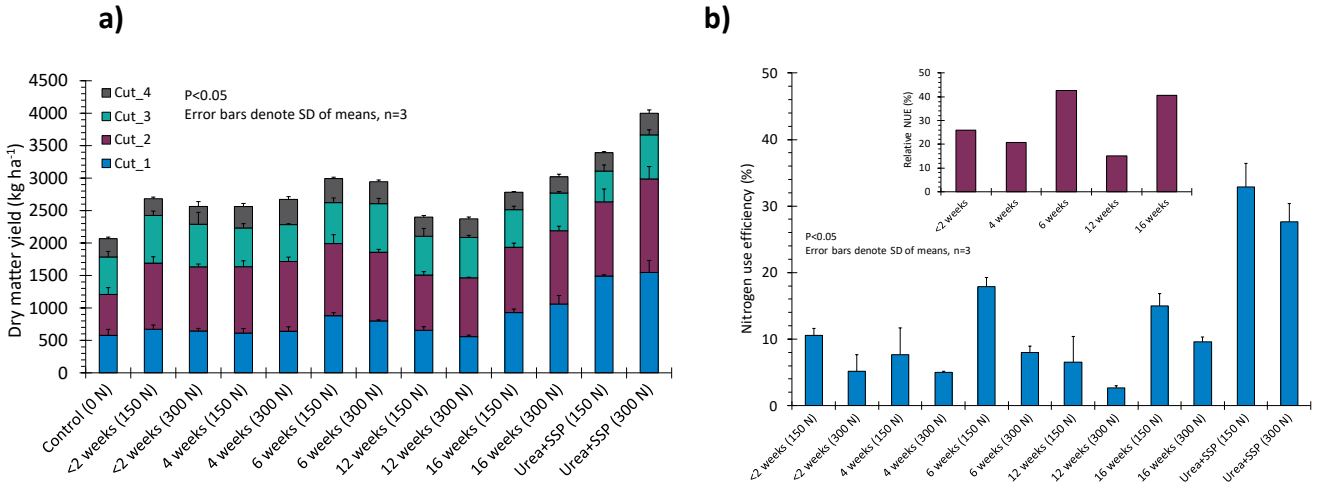

Figure 1 a) Dry matter yield recorded over four cuts after a single application of mineral fertilisers and paunch to ryegrass. b) Nitrogen use efficiency (NUE) recorded over three and after a single application of mineral fertilisers and paunch to ryegrass. Superimposed figure shows NUE of paunch relative to NUE of mineral fertiliser treatment. Number of weeks denotes compost age, followed by field equivalent N application rate in kg per ha.

- **Nitrogen Fertiliser Replacement Value (NFRV):**

Nitrogen fertiliser replacement value (NFRP) of paunch was estimated to be 40±17% across all types of paunch and rates. The average NFRV of paunch applied to grass were 39±19.8% (2 weeks), 35±15.5% (4 weeks), 56±19.3% (6 weeks), 19±17.5% (12 weeks), and 52±13.6% (16 weeks), respectively. Value range of NFRV of paunch within this study was generally higher than those reported in the literature for organic materials applied to grass under field conditions; for example, farm yard manure (range: 37-50%), cattle slurry (range: 10-39%), and composted household waste (<10%).

Benefit for Industry

A number of benefits to industry were identified as a result of this work. These included the following:

- Clarity on beneficial use of paunch for land application,
- Agronomic benefits, nutrient characteristics and preliminary land application rates,
- Clarity on risks associated with paunch land application such as weed germination
- Cost avoidance of gate fees for red meat processors,
- Reduced fertiliser input cost for agricultural industries,
- Avoidance of less environmentally friendly avenues for disposal (e.g., landfill)
- Maintenance of soil health via increased organic carbon.

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