MANAGING MANURE AND EFFLUENT

NATIONAL AGRICULTURAL MANURE MANAGEMENT PROGRAM (NAMMP)

Project Participants

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Problem

Manure emissions are a significant source of on-farm greenhouse gases (GHG) in intensive pig production. The quantification of emissions and mitigations from manure management in Australia has been limited. Research needs to be conducted to understand how to reduce GHG emissions, increase soil carbon and improve farm system design.

Project

These studies aimed to develop techniques to mitigate GHG emissions from land-applied livestock manures, gain an understanding of factors which affect GHG emissions, develop alternative handling and anaerobic processing technology for spent litter and understand the emissions resulting from the application of piggery manure compared to the baseline emissions from conventional fertilisers.

Value for Producers

Producers can reduce their GHG emissions by adding sorbers to the manure or composting and pelletising the manure instead of stockpiling it. By incorporating manure in soil, producers can reduce their GHG emissions and improve their soil quality and crop productivity. Producers can also reduce emissions by using short hydraulic retention time (<30 days) effluent treatment ponds.

Recommendations

Environmental factors such as temperature, soil moisture, the carbon to nitrogen ration, soil permeability and soil pH often have a much greater effect on GHG emission rates from livestock manure applied to soils than the type of manure or amount applied.

Quantification and mitigation of manure emissions begins with animal nutrition, which determines the mass and characteristics of manure excreted. After excretion, where and how long the manure is held can have a significant influence on total emissions.

Producers can reduce GHG emissions by 87 per cent by using short hydraulic retention time effluent treatment ponds. Deep litter manure management systems and deep litter combined with stockpiling the litter reduces GHG emissions by 85 per cent and 56 per cent respectively.

A sorber-based approach (where a sorber is incorporated into livestock manures which have been applied to soils) has strong potential to be developed into a technology to mitigate manure GHG emissions. Sorbers can substantially decrease GHG emissions by up to 60 per cent and potentially reduce the need for conventional fertiliser. Vermiculite tends to be the most efficient sorber.

Lower application rates of manures have the potential to reduce GHG emissions by up to 60 per cent and incorporation of manures in soil revealed a reduction of up to 75 per cent in GHG emissions. Composting and pelletising rather than stockpiling livestock manures showed a potential reduction of up to 70 and 80 per cent respectively in GHG emissions. The addition of low GHG-emitting livestock manures to soil could be a good management practice for increasing organic carbon, nitrogen availability, microbial diversity and resilience in soils as well as improving crop productivity.

More Information

- For a copy of the NAMMP factsheets, contact Rachael Bryant at rachael.bryant@australianpork.com.au
- For technical information, contact Gemma Wyburn at gemma.wyburn@australianpork.com.au