

RP2008

GHG EMISSIONS AND CARBON SEQUESTRATION POTENTIAL OF BIOSOLIDS IN SOUTH AUSTRALIA

Problem

Expanding global populations will require increased levels of wastewater, as more sewage is generated and environmental regulators demand higher effluent water qualities; a direct consequence of this is the production of more biosolids. Currently, one of the most economical and perhaps beneficial forms of reuse is agricultural application as an organic soil amendment and synthetic fertiliser substitute. However, the treatment, storage and use of biosolids also results in the release of some greenhouse gases (GHGs); namely, methane, nitrous oxide and carbon dioxide. Current methodologies for quantifying these emissions are poorly developed and require improvement. Additionally, there is very little locally available information on the carbon sequestration potential of biosolids when used on Australian soils.

Figure 1. [1] Agitated air drying (AAD); [2] Biosolids hardstand; [3] Loading biosolids into farmers' trucks; [4] Application of biosolids via gypsum spreader



Solution

This study aims to quantify the GHGs emitted from biosolids stockpiles and land application of biosolids in South Australia (SA) via direct measurement approaches. Additionally, the accumulation of carbon in the soil of agricultural land applied with biosolids in SA will be quantified. In doing so, an improved model to quantify GHGs emitted from biosolids production and use can be developed to replace the poorly suited models currently used by water utilities to estimate biosolids emissions.

Importantly, we can also start to answer the question 'How much carbon can be sequestered on agricultural land through biosolids?'.

Biosolids can potentially play a key role in the mitigation of greenhouse gas emissions via soil carbon sequestration.

Benefits

Our perception of 'waste' is changing; biosolids are now increasingly seen as a potential resource due to their inherent nutrient and carbon content. An improved model for quantifying GHGs emitted from the production, storage and use of biosolids will be well received by the water and wastewater industry, as the current legislated methodology is likely to overestimate these emissions. Additionally, efforts to assess the carbon sequestration potential of biosolids are in line with the Commonwealth Government's 'carbon farming initiative' and carbon sequestration more broadly as the national strategy for GHG mitigation. Landholders and farmers utilising biosolids may one day reap financial rewards from this environmental management practice as the country transitions toward the global carbon economy.

What are biosolids? I myself had no idea until I got involved in this research.

RUDD it:

Read up on biosolids

Understand the issues with biosolids

Distinguish fact from overly-hyped fears

Decide for yourself...

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