

N mineralization potential of amending dehydrated urban food waste (UFW) on contrasting acid agricultural soils

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Land application of organic waste (OW) is an environmental and agricultural practice for enhancing soil organic matter, reclaiming degraded soils and supplying plant nutrients (Audette et al., 2016) and avoids potential environmental impacts associated with direct organic waste landfill or waste incineration.

Food waste is a big concern as it accounts for one third of municipal solid waste, and is poorly recycled or reused. Globally, around 1.3 billion tons of food is wasted each year, which contributes a direct economic loss of USD 750 million and of AUD 5.9 million. These organic food wastes also contain nitrogen (and phosphorus), thus increasing the agricultural value.

Nitrogen mineralisation from organic materials is a key process for understanding the N dynamics in agro-systems. There are many factors which could affect net N mineralisation and availability in soils and this is exacerbated with respect to food waste owing to the complexity of waste, current processing methods, and the interaction with different soils.

This work will focus on the N mineralization of dehydrated urban food waste (UFW) on contrasting soils. UFW is the output of dehydration, or quick composting technology which is widely utilised in Melbourne, Australia, as a popular way of processing food waste. The aim of the work is to investigate N mineralization behaviour under laboratory conditions, by directly applying UFW to three agricultural soils. We recommend appropriate application rates of UFW to land for maximum nutrient availability and minimum environmental impact.