NP1005

CARBON REDUCTIONS FROM COMPOSTING FOOD WASTE

Research Question

While onsite composting is emerging in overseas cities that have banned the disposal of food waste to landfill, it is not clear how small-scale onsite composting compares with the large-scale offsite composting with regard to greenhouse gas (GHG) reductions.

To address this question, Waste Input-Output (hybrid-LCA) models will be developed using economic ABS data and experimental data from related composting trials. The modelling will estimate the net GHG emissions on a 'cradle-to-cradle' or 'plate-to-plate' basis to take into account the GHG benefits from avoided landfill methane generation, reduced waste transport and soil carbon sequestration.

Fig 1: Closed Loop composter being installed at Swinburne University, Melbourne (Sep 2016).

Methodology

The Waste Input-Output (WIO) models will be developed in three stages using ABS data and published waste collection data. The first WIO model will compare food waste GHG from landfilling vs offsite composting. The second WIO model will compare food waste GHG from onsite vs offsite composting. The third WIO model will compare composting food waste GHG from three states, VIC, SA & NSW.

The experimental data (e.g. GHG generation rates) will be sourced mostly from related onsite food waste compost trials. The first technology trialled is an in-vessel composting system manufactured by Closed Loop. The second technology trialled is a worm farm manufactured by Hungry Bins.

Fig 2: Hungry Bin worm farms being commissioned at Plant 4 IGA supermarket, Adelaide (Oct 2016).

Results

The GHG modelling PhD is part of a larger CRC Composting Food Waste for Food Production project with a focus on microbiological and sociological outcomes as well.

The composting technology partners have been selected and a number of trial sites have been identified including multi-unit residential towers, office tenancies, café precincts and large scale hospitality facilities. The field trials have commenced in September 2016 and are managed by the Swinburne University microbiological PhD student. It is expected all the experimental data for the process modelling inputs will be collected by June 2017.

Conclusions

With the movement to higher density living in Australian cities, new GHG models for food waste diversion need to be researched and developed. In particular, onsite composting systems that integrate well into local food production. The GHG modelling PhD with the linked microbiological and behavioural PhDs will validate onsite composting systems for high density residential and commercial contexts.

Anticipated impacts

A potential breakthrough is that onsite composting may be the better food waste management option for particular types of high-density facilities in terms of GHG reductions instead of transporting food waste to larger centralised composting facilities.

This breakthrough would assist developers and planners to best incorporate onsite composting into the inner city built environment.

Key statement about the research:

A Waste Input-Output model will assist decision makers in identifying and adopting the most carbon efficient composting options for diverting post-consumer food waste from landfill.

Further information

Contact Dr Vivienne Waller

E: vwaller@swin.edu.au

(Project leader for *Composting Food Waste for Food Production | A CRC for Low Carbon Living project)*

Contact

Name: Charles Ling

Organisation: Uni of South Australia

Twitter: @charles_ling

E: charles.ling@mymail.unisa.edu.au