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"Solidarity in a competing world - fair use of resources"

Strength and Disintegration Characteristics of Compost Pellets from Urban Waste in Sri Lanka

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Abstract

Recovering resources from urban organic wastes can serve agricultural production as well as provide cost savings through volume reduction. However, in both liquid and solid waste management, the magnitude of planned resource recovery so far remains restricted in low-income countries, although the agricultural value of both resources is well recognized.

In Sri Lanka, urban waste composting is well known, but marketing is poor and so is Word-of-Mouth promotion as standard compost receives limited attention from farmers.

To address this issue, the IWMI implemented a resource recovery treatment project based on co-composting of nutrient rich fecal sludge and organic municipal solid wastes. The project looks at the safe production of co-compost, compost blending and pelletizing, its agricultural application, and the economic viability of the whole process. This paper summarizes results on the pelletizing process which makes compost transport, storage and application easier, and also allows to influence nutrient release.

Pelletizing increases the density of the compost material by 30%. In general, compost-pelletizing process consists of compost drying and pulverization prior to pelletization. This research confirmed that the above two steps can be successfully eliminated while reducing energy consumption and process cost.

With the right pressure and humidity, compost pellets can also be produced without binding agent. However, binding agents can increase pellet strength, as compared to pellets without binders. Most importantly, pellets without binding agent did not disintegrate in immersed water for a testing period of one month. Rice flour binder added by 3 % was able to achieve a quick pellet disintegration within 3 days. Evidence proved that careful selection of binding agent could control the time for disintegration while enabling the production of a tailor made fertilizer for crop type, depending on the crop nutrient demand. In addition, "roller and die" pelletizer appears more suitable in compost pelletizing, compared to 'extruder' models.

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Keywords: Co-composting, pelletization, resource and nutrients recovery, urban waste

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