## عنوان مقاله:

Sewage sludge composting in a rotary drum reactor: stability and kinetic analysis

#### محل انتشار:

مجله بین المللی بازیافت مواد آلی در کشاورزی, دوره 4, شماره 4 (سال: 1394)

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### خلاصه مقاله:

Background Composting is one of the sustainable practices to convert sewage sludge into useful agricultural product because it is rich in organic matter, micro- andmacronutrients, which is essential for plants growth andsoil fauna to live. Therefore, the present study was torecycle the sewage sludge by rotary drum composter. Fivesets of experiments (C/N 15, 20, 25, 30 including control)were carried out in the reactor, where sewage sludge wascoupled with sawdust and cattle manure to attain theoptimal feedstock. The process was monitored with respectto physicochemical characteristics and stability parametersduring 20 days of composting period. In addition, thekinetic parameters km and rm have been evaluated in thepresent work. Results Higher reductions in CO2 evolution and oxygenuptake rate (OUR) observed in C/N 30 showed the stability, resulting in the total biodegradable ingredients to bestabilized. Similarly, higher percentage reduction in carbon-nitrogen ratio was observed in C/N 30 followed byC/N 20, C/N 25, C/N 15 and control experiments, respectively, indicates maximum degradation was achieved; as itcorroborate higher temperature regime occurred in C/N 30. The composting parameters such as moisture content,volatile solids, CO2 evolution, OUR and C/N ratio werereduced significantly (p.05). The kinetic model usedillustrated the comparable variations in Michaelis constant(km) and maximum rate constant (rm) under varying proportions of the initial feedstock. The overall assessment ofkinetic data for C/N 30 experiment showed enhancement ofdegradation during the composting process. Conclusions The results suggested that composting ofsewage sludge with optimal proportion of cattle manureand saw dust, especially in C/N 30, can produce stablecompost within 20 days .of composting

## كلمات كليدى:

Sewage sludge Sawdust Rotary drum C/N ratio Stability Kinetic analysis

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