

Title: Bacterial density of sawdust used in bed of stables of type Compost Barn

Authors: LIMA, M. P. M.¹; RAMOS, A. F. L. H.¹; DEL'DUCA, A.²; NUNES, R. M. R.¹; GUIMARÃES, A. S.³; MENDONÇA, L. C.³, BRITO, E. C.^{1 3} & CESAR, D. E.¹

Institutions: ¹ UFJF - Universidade Federal de Juiz de Fora (Rua José Lourenço Kelmer, s/n – Martelos - 36036-330 - Juiz de Fora, MG - Brasil), ² IF Sudeste MG - Instituto Federal do Sudeste de Minas Gerais, Campus Juiz de Fora. (Rua Bernardo Mascarenhas, 1283 – Fábrica –36080-001 - Juiz de Fora, MGI), ³ Embrapa - Centro Nacional de Pesquisa em Gado de Leite (Rua Eugênio do Nascimento, 610 - Dom Bosco - 36038-330 - Juiz de Fora, MGI)

Abstract:

Compost Barn (CB) is basically a type of loose housing with bed of organic material, in general sawdust or dry wood shavings, and a gang of power. Physical and chemical characteristics of this material directly affect the functioning of the system. The acquisition of this material is an additional cost of this system, especially in times and places where the offer is small. In this work we performed an *in vitro* experiment to monitor the total density of bacteria in sawdusts of different origins and mixed with MDF. Samples of sawdust and MDF were collected in a farm that was preparing for deployment of a system of CB and bought sawdusts from different places: origin 1 - source close to the farm, same city (Cruzília, MG), with sawdust of irregular sizes (Treatment 1); origin 2 - source far away from the farm, another city, in this case the sawdust with aspects more uniform (Treatment 2). A third treatment consisting of a mixture 1:1 sawdust origin 2 and MDF (Treatment 3) were also included. Aliquots (5 g) of the material of each treatment (triplicates) were distributed in a petri dish of plastic, kept at room temperature for 30 days. Initial samples and final were fixed in PFA (final concentration of 2%), sonicated (three times with amplitude of 110.7 μ M for 60s) and centrifuged (three times 500x g for 5 min). After being filtered (filter polycarbonate 0.2 μ M), were stained with DAPI and visualized with an epifluorescence microscope. The higher density of bacteria at the beginning of the experiment was found in Treatment 2 (3.5×10^9 cells g⁻¹). However, no significant difference was found with the number of bacteria present in sawdust from another source and neither with this sawdust mixed with MDF. The treatments 1 and 3 showed a significant increase in the number of bacteria after 30 days of experiment. There was no a significant difference during this interval in density of total bacteria in Treatment 2. The sawdust originated from more distant location of the farm where the system of CB is being deployed showed bacterial growth only when mixed with MDF. It is believed that this is related to the particle size of each material and the quality of carbon. The fine particles facilitate the management and the mixture of the bed. In addition, they allow the accession of a larger number of microorganisms because they have greater surface: volume ratio. Thus, bacteria may grow faster and increase the temperature of the compound and consequently the system efficiency

Keywords: Composting, sawdust, temperature, microbial ecology

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