Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

ENVIRONMENTAL PERFORMANCE OF SAJOR-CAJU MUSHROOM PRODUCTION BASED ON FARM SIZES IN THAILAND

Siriprapa Ueawiwatsakul[1], Thumrongrut Mungcharoen[2], Rungnapa Tongpool[3*]

[1]TAIST-Tokyo Tech, Faculty of Engineering, Kesetsart University, Bangkok 10900, Thailand
[2]Faculty of Engineering, Kasetsart University, Bangkok 10900, Thailand
[3]LCA Lab, National Metal and Materials Technology Center, Pathumthani 12120, Thailand

Abstract

Unlike other vegetables, mushroom production requires several substrate ingredients, energy to sterilize the substrate, water to humidify the fruiting house and waste management of the spent substrate and used materials. This work studied the environmental impacts and eco-efficiency of sajor-caju mushroom *(Pleurotus sajor-caju (Fr.) Sing.*) production in terms of climate change potential, acidification potential, water depletion potential and fossil fuel depletion potential, using life cycle assessment (LCA) method. The results showed that the mushroom production in small and large farms had nearly the same environmental performance. Their environmental impacts were lower and their eco-efficiencies were higher than those for medium-sized farms. This means the medium-sized farms would cause more environmental impacts in order to obtain the same profit as the other two farms. It was found that there was inefficient use of both substrate and energy in the medium-sized farms. This is probably because the medium-sized farm had relatively low financial limitations, compared to the small farms, and relatively less concern over efficient use of resources, compared to the large farms. The reduction of sawdust and rice bran, used as substrate ingredients, as well as wood, used as energy source for sterilization, to the same amounts as those used in the small farms could reduce environmental impacts (5-25%) and improve eco-efficiencies (10-40%) of the medium-sized farms to be close to those for large and small farms.

Key words: climate change, environment, farm size, life cycle assessment, mushroom

Received: May, 2014; Revised final: August, 2014; Accepted: September, 2014

*Author to whom all correspondence should be addressed: e-mail: rungnapatongpool@gmail.com; Phone: +66 25646500; Fax: +66 25646404