

Effects of larval density and feeding rates on growth and waste reduction using Black Soldier Fly larvae

SOARES J. (1)

1 The Tomorrow Company, Vila Nova de Gaia, Portugal

The organic solid waste degradation through black soldier fly larvae (*Hermetia illucens* L.) constitutes a promising alternative in waste management, given that it generates several products with added value. The development of this process and its application at an industrial scale implies knowledge of the load capacity itself. In this study, we investigated the effects of larval density (1, 2.5, and 5 larvae/cm²) and feeding rate (75, 125, and 175 mg/larvae/day) on the bioconversion of organic solid waste. A fixed feed regime was applied at the start. The results showed that both variables significantly affected the bioconversion process. A daily feeding rate of 125 mg fruit/vegetable mix (1:1 ratio) per larva and a larval density of 2.5 larvae/cm² resulted in an optimum trade-off between material reduction efficiency and biomass production. Individual larval weight and total larval yield increased with higher feeding rates at all three larval densities. Therefore, we have demonstrated that larvae of the black soldier fly might convert large amounts of organic waste into protein-rich biomass, thereby contributing to sustainability.