

SUGARCANE (*Saccharum officinarum*) TRASH DECOMPOSITION WITH A DEVELOPED FUNGAL-BACTERIAL BIOFILM

K.P.N.K. Chandrasiri¹, G. Seneviratne², D.M. Jinadasa¹

*¹Department of Soil and Water Resources Management, Faculty of Agriculture,
Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka.*

²Institute of Fundamental Studies, Hantana, Kandy, Sri Lanka.

After harvesting, sugarcane trash requires management for turnover. Though trash blanketing is the best option for the trash decomposition, takes a few months. Thus, main objective of this research was to ameliorate trash turnover rate by incorporating fungal-bacterial biofilms (FBBs). This research comprised of two studies. First study examined the relationship between weight loss and leaf surface functional groups of organic molecules, as evaluated by Fourier Transform Infra Red (FTIR) spectroscopy. A piece of moist litter (ca. 1 cm x 1 cm) was put on a layer of 0.5 mm sieved soil covered by a synthetic mesh in tissue culture plate wells, and incubated. Dry weights of litter and FTIR spectra were recorded weekly. The first study concluded a positive correlation between weight loss and FTIR peak degradation of some organic molecules. For the second study, fungi and bacteria were isolated from litter, and FBBs were formulated. FBBs and monocultures were taken as microbial treatments. Treatments with urea and molasses were considered as reference treatments. Both dry and fresh litter pieces (3 cm x 1 cm) were put on a layer of 2 mm sieved soil covered by a synthetic mesh in plastic Petridishes and treatments applied and incubated. After one month, soil organic carbon and total nitrogen contents were determined to calculate C:N ratio. Litter fragmentation percentage was evaluated by using a blending method. As though reference treatments showed higher values of the measured parameters, they were not significantly different from other treatments. High litter fragmentation and low C:N ratio were observed in FBBs. It is apparent from this study that enhancing the trash decomposition rate by applying FBBs is likely to be beneficial. However, further studies are necessary to investigate the role of FBBs on trash decomposition beyond one month in field conditions.

Key words: Biofilms, Fungal-bacterial biofilms, Sugarcane trash, Trash blanketing, Trash decomposition