

Stabilization of Swine Manure Using Microbial Inoculants at Different Application Frequencies

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The waste disposal is one of the major constraints associated with swine production because of negative environmental impact. The discharging swine manure from the piggeries takes a long time to decompose hence generates unpleasant odor. Therefore, objectives of the present study were to stabilize and reduce unpleasant odor of swine manure using microbial inoculants, and to find out the most efficient application frequency of the inoculants for accelerated stabilization. Effective microorganisms (EM) and Live-Gro® probiotic solution were used as inoculants, after diluting 1:20 and 1:10 ratios, respectively. The inoculums were applied separately in 2-day, 1-week, and 2-week intervals for 30 days. The control manure samples were added 5 ml water only at the frequency and all treatments were carried out with three replicates. The physicochemical parameters such as pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), salinity, Dry Matter (DM), and Volatile Solids (VS) were taken at a defined time interval. Ammonia nitrogen, soluble nitrate nitrogen, and soluble phosphate concentrations were measured after 14 days to assess the rate of decomposition. ANOVA and Tukey tests were used for data analysis. Manure samples treated with EM and Live-Gro® solution at 2 days interval reached rapid stability (within 10 days) when compared to control showing low pH and higher TDS than in the control. There was a declining trend in DM, VS, Soluble NO₃-N, and soluble NH₃-N with the time of storage in all inoculated samples which were more prominent in 2-day interval application. The samples treated with EM at an interval of 2 days showed a significantly ($p<0.05$) low DM (28.76%) content and ammonia nitrogen (723.7ppm) after 28th day of inoculation. In conclusion, it could be mentioned that the application of EM at 2-day intervals to swine manure could efficiently stabilize and reduce unpleasant odor.

Keywords: Swine manure, Microbial Inoculants, EM, Live-Gro®

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