

ORGANIC DUST EXPOSURE FROM COMPOST HANDLING OPERATIONS

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Environmental measurements were made during hand loading of compost in a small scale recycling project. The compost consisted of chopped leaves and branches stored outdoors during a spring and summer of record rainfall. Exposures to organic dust from this material resulted in the hospitalization of one individual experiencing severe respiratory illness. Measurements included inspirable and respirable dust, particle size distribution, endotoxins, spore counts and viable microorganisms. Visible clouds of fine particulate were easily generated during handling activities; impactor measurement of this aerosol indicated a mass median aerodynamic diameter of approximately 3 micrometers. Worst case dust concentrations of inspirable and respirable particulate were 150 and 83 milligrams per cubic meter (mg/m^3) respectively; however, routine dust exposures from compost handling were below $1 \text{ mg}/\text{m}^3$ for all size fractions. Microscopic examination (both light and SEM) of these dusts indicated a predominance of spores. Airborne spore counts, made directly from cellulose ester filters cleared with acetone, ranged from 106 to 109 spores/ m^3 . Mesophilic fungi and bacteria, collected using the AGI 30 impinger with distilled water, ranged from 105 to 108 colonies/ m^3 . Airborne thermophilic bacterial concentrations were lower, 103 to 104 colonies/ m^3 . Spore counts made from filter samples collected downstream from the impinger showed high spore penetration, with break-through weighted toward smaller diameter spores, $< 3 \mu\text{m}$. Endotoxin concentrations from inspirable, thoracic and respirable dust samples ranged from 636 to 16,300 endotoxin units/ m^3 . Levels of contaminants found here are consistent with those associated with respiratory illness in other agricultural settings.

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