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Abstract

Remediation of a Soil Contaminated with Fat from Wastewater of a Cheese Industry

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Abstract: Research was conducted to implement a composting process to remediate soil contaminated with fat from cheese factory wastewater. Four composting treatments (9 kg) were established, where nutrient content was varied and/or soil structure by adding fertilizer and/or oat straw as follows: T-I = contaminated soil (control); T-II = contaminated soil + fertilizer; T-III = contaminated soil + oat straw; and T-IV = contaminated soil + oat straw + fertilizer. Soil moisture in experimental units was maintained to 75% of field capacity, mixtures were aerated once a week, and measurements of pH, electrical conductivity (EC), fats, and microorganisms were performed every 4 weeks. T-IV was the most efficient with 96% removal of fat followed by T-II and T-III with 86% in both cases, and 81% for T-I. In T-IV, increase of nutrients and soil porosity improved microorganisms working conditions so there was a greater fat removal. Bacteria and fungi grew normally in soil with a pH of 8.2 and EC of 10 dS m⁻¹. The cost (Mexican pesos) of remediation of 222 tons of soil was: \$8,130 (T-I), \$34,000 (T-II), \$24,810 (T-III) and \$50,685 (T-IV). It is worth mentioning that soil is impacted with salt content in wastewater, increasing restoration cost.

Keywords: Cheese factory wastewater, fat, composting, costs, salt.

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