NITROGEN REMOVAL FOR ON-SITE SEWAGE DISPOSAL: A RECIRCULATING SAND FILTER/ROCK TANK DESIGN

Published by the American Society of Agricultural and Biological Engineers, St. Joseph, Michigan www.asabe.org

Citation: Transactions of the ASABE. 33 (2): 0525-0531. @1990
Authors: B. E. Lamb, A. J. Gold, G. W. Loomis, C. G. McKiel

ABSTRACT: The nitrogen removal abilities of recirculating sand filter/rock tank (RSF) systems and conventional septic tank/soil absorption trench systems were compared in a field laboratory. The degree of total nitrogen removal was a function of both nitrification and denitrification. Nitrification was the limiting step for nitrogen removal in the RSF system. In the RSF systems, nitrification was achieved in recirculating sand filters, with an average of 66% for the two-year study period. Denitrification was achieved in buried rock tanks using three different carbon sources. With raw septic tank effluent as the carbon source, an average of only 25% denitrification was observed, while with methanol and ethanol as the carbon sources, mean denitrification was 99%. Relative to the conventional systems, the RSF systems achieved a mean total nitrogen removal of 36% with septic tank effluent as the carbon source and 78-82% with methanol and ethanol as the carbon sources.