

# The Performance of a Biofilter for Odour Removal

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## **Introduction:**

The overall purpose of this study was to evaluate biofilter operation for odour removal at the Edmonton Research Station (ERS). For a sustainable biofilter, parameters such as the air retention time through the medium, change in water delivery rate, and temperature stability impact its operating effectiveness. The emphasis of this study was to measure the effect of water application to the biofilter as well as its effect on air flow through the medium and on plenum pressure. Also, both peat moss and the polystyrene were studied as filter materials for removing odour from the exhaust air from a manure treatment plant at the ERS.

Two trials were completed under different conditions with peat moss. The results of these tests indicate that peat moss reduced odours by 59% when applying both water and microorganism nutrients to the media. In another trial, peat moss reduced odours by 33% when no water or microorganism nutrients were applied. When using finely-ground polystyrene as a medium, odours were reduced by 20% with the application of water and microorganism nutrients. Although, the odour was only reduced by 20% the character of the odour or hedonic tone was more pleasant. However, the hedonic tone was difficult to quantify. The airflow in the coarse peatmoss was significantly reduced over the trial period (90%) whereas the airflow through the ground polystyrene did not change. The plenum operating pressure was 3 and 0.2 in of water pressure, respectively.

## **Implications:**

Biofilters can effectively reduce odour emission from pig barns. The application of water and nutrients to feed microorganisms increased odour reduction. Biofilters may also reduce offensiveness of the odour.