

ENVIRONMENT

Title: A Two-Year Study of the Effectiveness of Geotextile Covers to Reduce Odor and Gas Emissions from Manure Storages
NPB# 01-150

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Abstract. Odor, hydrogen sulfide (H_2S), ammonia (NH_3) and volatile organic compounds (VOC) were measured between May and October 2000, and between April and October 2001 at three sites in Southwest Minnesota. Each site consisted of a pair of farms (nursery N1, N2; 2,000-head finishing F2A, F2B; 3,000-head finishing F3A, F3B). A manure storage from each pair was selected as treatment, where a geotextile cover (BioCap™) was installed. Results showed that there was a significant deterioration of the performance of geotextile covers in reducing odor and gas emissions from manure storages on the second year of the study. Odor emissions were, on average, reduced by 48% over the two-year period. Emission rates were reduced by 90% in terms of H_2S in the first year, but no significant differences were found between covered and non-covered manure storages in 2001. NH_3 emissions were, in average, reduced by 44% in 2001. No significant differences in total-VOC emissions from covered and non-covered manure storages were observed during the two-year study. Analysis of the ambient H_2S data suggested that the covers were effective in reducing ambient H_2S concentrations near manure storages located at the two finishing sites. Odor and gaseous emission rates from all sites were poorly correlated with most manure characteristic parameters (nutrients, solids, organic matter, VOCs). Cover effectiveness may have been effected by improper management of the cover at one of the sites

Keywords. Swine manure, hydrogen sulfide, ammonia, odor, covers.

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