

## PUBLIC HEALTHWORKER SAFETY

**Title:** Influence of grass hedges on the transport of antimicrobials, antimicrobial resistance genes, and antimicrobial resistant pathogens after land application of swine manure - **NPB #12-012**

**Investigator:** Shannon L. Bartelt-Hunt

**Institution:** University of Nebraska-Lincoln

**Date Submitted:** 1/31/2014

**Scientific Abstract:** The objective of this study was to determine the effects of narrow grass hedges on the fate and transport of antimicrobials and antimicrobial resistance genes (ARGs) in runoff and in soil following the land application of swine manure slurry. Swine manure slurry was land applied to 0.75m wide by 4.0m long plots established on an Aksarben silty clay loam soil located in southeast Nebraska. Swine manure was applied at a rate to meet the 3-year nitrogen (N) requirements for corn. Swine manure was applied to plots with and without a narrow grass hedge to evaluate the effect of the hedge on antimicrobial and ARG occurrence in runoff following 3 30-min simulated rainfall events. The grass hedge proved to be consistently effective in reducing concentrations of the antimicrobial tylosin in runoff ( $p=0.016$ ), and the total mass of tylosin transport in the runoff was reduced by an order of magnitude in plots with the grass hedge compared to plots without the grass hedge. Because we did not observe significant differences in the total amount of runoff between plots, we can attribute the reduction in mass loading to the decrease in tylosin concentration in plots with the grass hedge. The results of the grass hedge on removal of ARGs in runoff was less clear cut. The effect of the grass hedge on removal of *erm(B)* was not statistically significant ( $p=0.2465$ ), however, the grass hedge did significantly reduce the amount of 16S rRNA in the runoff. rANOVA results suggest that the narrow grass hedge had a significant effect on removal of microbial genes in runoff ( $p = 0.0014$ ). To our knowledge, this is the first effort to evaluate the effect of common and low cost best management practices such as narrow grass hedges on the transport of microbial genes in runoff.

---

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

---

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • [pork.org](http://pork.org)

---