

Danielle Long

M.S. Student

My research encompasses environmental microbiology and agricultural practices.

The main goal of my research is to reduce the environmental efflux of pathogens to the drain water of agricultural fields. Each year in Ohio 120,000 tons of biosolids are applied to agricultural fields as fertilizers and bulking agents. One potential negative outcome is that pathogens that may reside within the biosolids may transport through the soil and enter drain water through drain tile. For my research I used *Escherichia coli* and *Enterococcus spp.* as surrogates for pathogens and have attempted to determine if soil depth and/or the retention of effluent (capping drain tiles) can be used as best management practices to reduce the viability and transport distance of any biosolid amended microorganisms.

I have established three objectives to reduce the number of pathogens leaving a biosolid amended agricultural site. Objective one is to use an existing advection dispersion model to predict the resulting effluent densities of microorganisms from a biosolid amended field. Objective two is to use the model to estimate an ideal soil depth that reduces effluent densities of microorganisms to the infrequent full body contact regulations of the EPA (576 CFUs/ 100 ml *E. coli* and 151CFUs/ 100 ml *Enterococcus spp.*). Objective three is to determine if (when soil depth is not ideal) retaining effluent within the drain tiles for a period of time can reduce the densities of viable microorganisms in effluent to the established EPA regulations.