Report for 2003MA9B: Potential Movement of Pesticides Related to Dissolved Organic Matter from Organic Fertilizer Application on Turf

- Other Publications:
  - Li, K., W.A. Torello, and B. Xing. 2003. Effect of dissolved organic matter on pesticide leaching in a USGA sand column experiment. Agronomy Abstracts, Denver, CO. Nov. 2-6. 2003.
  - Xing, B. and L. Kun. 2003. Pesticide movement and organic fertilizer application on turf. Water Resources in the Northeast Science and Policy Conference; Dec. 5, 2003; University of Massachusetts; p. 18 of the Final Program book. PowerPoint Presentation of this paper is available at http://www.umass.edu/tei/wrrc/presentations/Li.pdf

Report Follows

Project Description: Incorporation of organic fertilizers/amendments has been, and will continue to be, a popular strategy for golf course turfgrass management. Dissolved organic matter (DOM) derived from these organic materials may, however, facilitate organic chemical movement through soils. A batch equilibration technique was used to evaluate the effects of organic fertilizer-derived DOM on sorption of two organic chemicals (naphthalene and chlorpyrifos) in USGA (United States Golf Association) sand and a silt loam soil (Typic Fragiochrept). DOM was extracted from two commercial organic fertilizers. Different concentrations of DOM were used in the sorption experiments. In addition, surface tension was determined for solutions with various DOM concentrations. Surface tension decreased with increasing DOM concentration in water, indicating that the extracted DOM had similar properties to surfactants. Data from the sorption experiments showed that sorption coefficient was significantly reduced with increasing DOM concentration as compared with that without any DOM addition. These results suggest that organic fertilizer-derived DOM might lead to enhanced transport of applied chemicals in turf soils if not used properly. Further research with different chemicals and soils is underway. Also, we have started column experiments. Characterization of sequentially extracted humic substances from compost was initiated.

Publications :

Abstracts:

1) Li, K., W.A. Torello, and B. Xing. 2003. Effect of dissolved organic matter on pesticide leaching in a USGA sand column experiment. Agronomy Abstracts, Denver, CO. Nov. 2-6. 2003.

2) Xing, B. and L. Kun. 2003. Pesticide movement and organic fertilizer application on turf. Water Resources in the Northeast Science and Policy Conference; Dec. 5, 2003; University of Massachusetts; p. 18 of the Final Program book.

Students Supported:

One undergraduate student
One Ph.D. student