

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

- Articles in Refereed Scientific Journals:
  - Li, K., B. Xing, and W.A. Torello, 2005, Effect of organic fertilizers derived dissolved organic matter on pesticide sorption and leaching. *Environ. Pollut.* 134: 187-194.
  - Heymann, K., H. Mashayekhi, and B. Xing, 2005, Spectroscopic analysis of sequentially extracted humic acid from compost, *Spectroscopy Letters*, (in press).
- Dissertations:
  - Li, K., 2004, Evaluation of organic turfgrass management and its environmental impact by dissolved organic matter, Ph.D. Dissertation, University of Massachusetts, Amherst, MA, 101pp.

Report Follows

**Title:** Potential Movement of Pesticides Related with Dissolved Organic Matter from Organic Fertilizer Application on Turf

**Start Date:** May 1, 2004

**End Date:** February 28, 2006

**Research Category:** Water Quality

**Focus Category:** Nonpoint Pollution; Surface Water; Water Quality;

**Descriptors:** Dissolved organic matter (DOM); Sorption; Organic contaminants

**Principal Investigator:** Baoshan Xing

**Project Description:** Incorporation of organic fertilizers/amendments including composts has been 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. DOM was extracted from two commercial organic fertilizers and used for a column study. In this column study, we used chlorpyrifos and USGA (United States Golf Association) sand. We observed that DOM reduced the retention of chlorpyrifos in the column as compared with the 0.01 M solution without DOM. We also characterized compost materials using sequential alkaline extraction and spectroscopic techniques (e.g., FTIR and NMR). Significant structural variations among the extracted humic acid (HA) fractions and the original compost were observed. A decrease in the atomic C/H ratio and increase in the atomic C/O ratio among these HA fractions represented an increase in aliphaticity in conjunction with a decrease in polarity and aromaticity, confirmed by spectroscopic data.

**Publications:**

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**Students Supported:**

- One undergraduate student
- One Ph.D. student