

**NEMATODE COMMUNITY STRUCTURE AS AN ECOLOGICAL INDICATOR
OF RESTORATION AT SITES IMPACTED BY CRUDE OIL AND BRINE**

Cas Bridge*

Jennifer Busch-Harris

Kerry Sublette

The University of Tulsa
800 South Tucker Drive
Tulsa, OK 74104

Voice: 918-631-2517

Fax: 918-631-2091

cas-bridge@utulsa.edu

Tim Todd

Kansas State University
Manhattan, KS

Kathleen Duncan

The University of Oklahoma
Norman, OK

Nematodes are commonly used as bioindicator organisms to assess soil health. They are ubiquitous in soil, sensitive to environmental changes, and can be analyzed easily and inexpensively. In order for nematode community structure to be assessed the nematodes are separated into groups based on trophic level and colonizer-persister (c-p) class. We used differences between trophic groups, c-p classes, and maturity indices to compare the recovery of nematode community structure of three areas impacted by crude oil and brine in the Tallgrass Prairie Preserve in Oklahoma. Beginning in 1999 three spills of crude oil plus produced water brine were treated with combinations of ripping, fertilizers and hay, and a downslope interception trench in an effort to demonstrate an inexpensive, easily implemented, effective remediation plan. There was no statistically significant effect of treatment on the biodegradation of crude oil. However, TPH reduction clearly proceeded in the presence of brine contamination. The average half-life considering all impacted sites was 267 days. The combination of hay addition, ripping, and a downslope interception trench was superior to hay addition with ripping, or ripping plus an interception trench in terms of rates of sodium and chloride leaching from the impacted sites. Reductions in salt inventories (36 months) were 73% in the site with hay addition, ripping and an interception trench, 40% in the site with hay addition and ripping only, and < 3% in the site with ripping and an interception trench. In 2007 and 2008 the recovery of these three treated areas was investigated through assessment of soil chemistry, surface vegetation and nematode community structure. The sites were quite dynamic during this time period; however, nematode community structure was seen to correlate with changes in soil chemistry.

###