

# Enhanced Biodegradation of TOrCs in Stormwater Infiltration Systems

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## Background

- Urbanization has negatively affected water resources
- Stormwater runoff contaminates urban receiving waters
- Current practices not 100% effective
  - Polar TOrCs filter through sand based infiltration systems.

## Research Goals

- Assess degradation rates of parent TOrCs
- Identify transformation products

## Scope

- Major TOrCs monitored include diuron, atrazine, and fipronil
- 30 microcosms used to track biodegradation
- Sampled microcosms weekly for 7 weeks, used liquid chromatography tandem mass spectrometry (LC-MS/MS) to monitor TOrC degradation

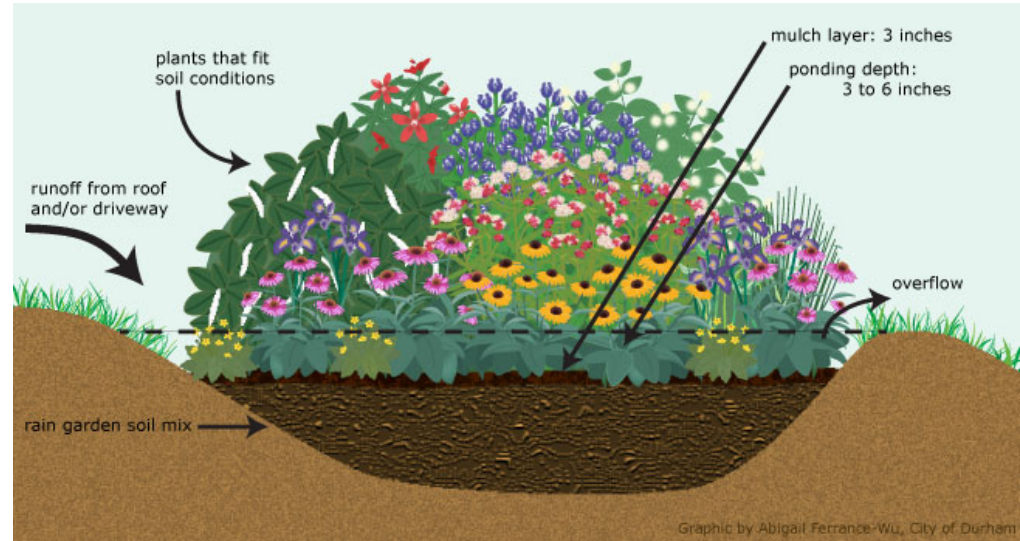


Figure 1. An example of a rain garden as a stormwater infiltration basin. [http://durhamnc.gov/ich/op/pwd/storm/Pages/residential\\_tips/raingardens.aspx](http://durhamnc.gov/ich/op/pwd/storm/Pages/residential_tips/raingardens.aspx)

## HYPOTHESIS

The type of carbon source added to a stormwater infiltration basin will have an effect on TOrC biodegradation rates and transformation products.

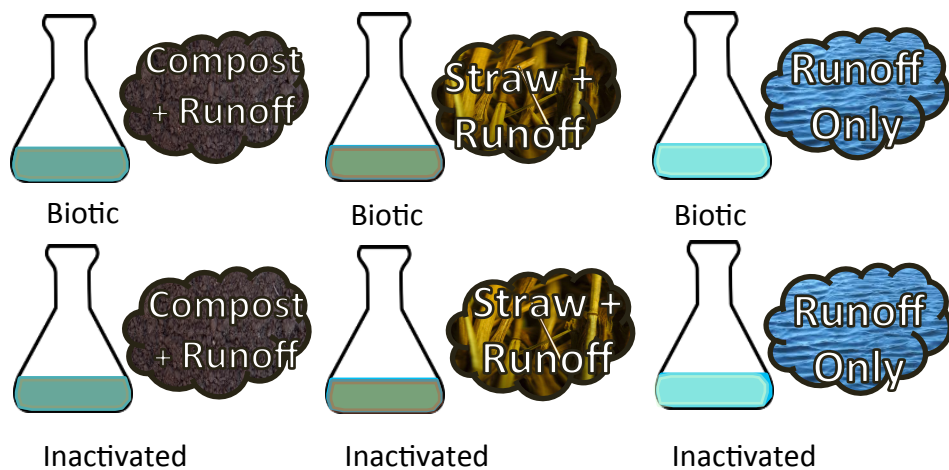


Figure 2. Set up of the 30 microcosms used in this project

### Microcosm Set-Up

- 5 replicates of each different microcosm
- Straw and compost 2 sources of dissolved organic carbon
- Inactivated microcosms had no biodegradation and were used as a control

### Results and Conclusions

- Carbon source does affect TOrC biodegradation
- Compost microcosms have the most transformation product generation
- Knowing which transformation product the TOrCs are degrading to is important because sometimes the transformation product is more toxic than its parent TOrC.

- Example: Diuron and dichloroaniline

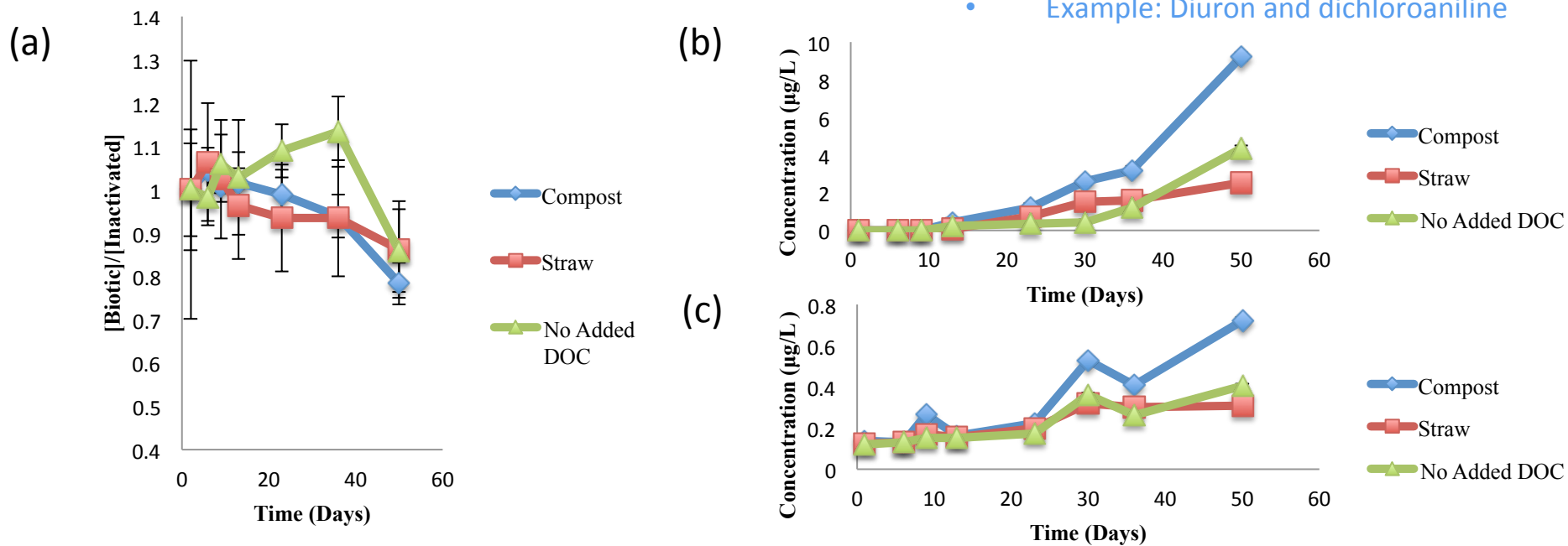


Figure 3. Degradation of diuron (a) and generation DMPMU (b) and dichloroaniline (c).