LIVING LAB - ONTARIO

Soil Health - Ecotoxicology 2022

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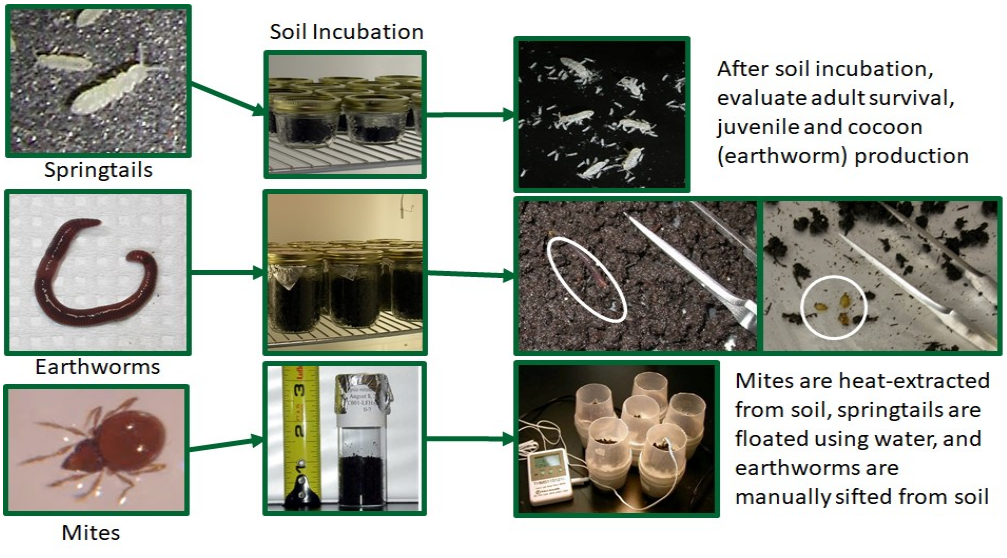
Research Objectives

- To use soil toxicity test methods, initially developed to look at impacts of chemicals or other stressors on soil organisms, as measures (or bio-indicators) of soil health for different agricultural management practices

Pour plus d'informations sur le chercheur d'AAC, en français : Juliska Princz | Répertoire des scientifiques et des professionnels (science.gc.ca)

What Does This Project Mean for Agriculture in Ontario?

- Soil toxicity methods can be used to see how toxic or supportive a soil is for organisms
- Provide insight into how management activities change the diversity and function of different soil biological communities



Sampling and Analysis

- Soils were collected from various fields, with different cropping techniques (e.g., cover crops, no cover crops); some sites were analysed for pesticide residues
- Soils were air-dried, large debris was removed, and remixed with water for invertebrate tests
- Tests were completed using representative lab-cultured species: *Folsomia candida* (springtails), *Eisenia andrei* (earthworms) and *Oppia nitens* (mites)
- Tests were run for 28 days (springtails and mites) or 56 days (earthworms) at 20°C, and impacts on adult survival and juvenile production were measured

Sites Sampled

Site 2 - Groot

Soil sampling from strips with and without grazing in rotation

Site 3 - Liang

Soil sampling for different cover crop combinations

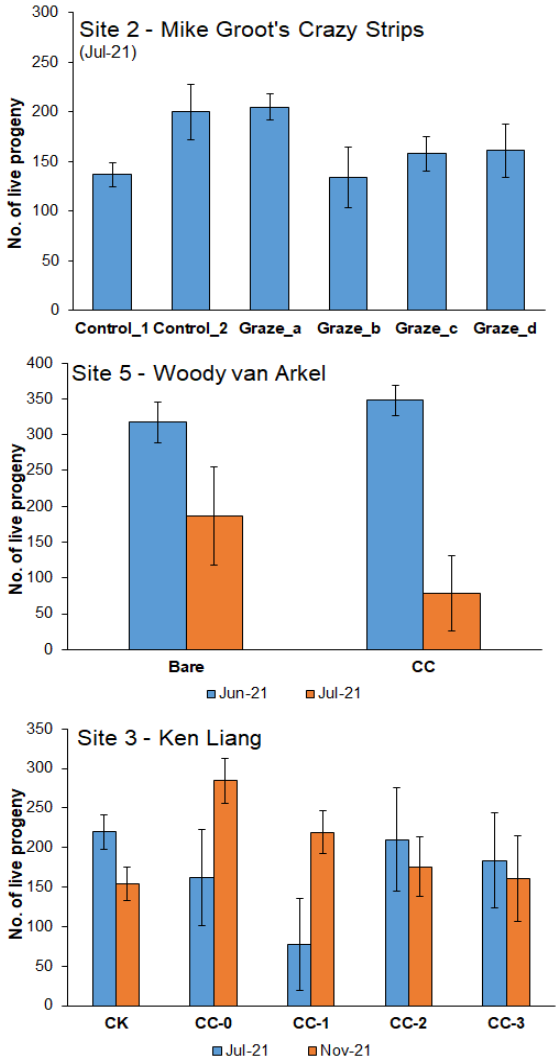
Site 5 - Van Arkel

Soil sampling in areas with and without perennial cover

Early Results

Average Springtail Reproduction at Three Sites

- Samples were collected, as indicated, early (blue bars) and later (orange bars) in the growing season



- No difference found between fields with and without cover crops but differences were found between collection events; the same was found for earthworms
- The lab species are applicable as surrogate bio-indicators, but we need to look at why there is a difference between collection events

Key Terms

- **Soil toxicity:** amount and nature of chemicals in soil that may make it harmful to specific organisms
- **Surrogate bio-indicators:** organisms used for assessments to represent a broader ecosystem