Cover crops to build resilience and adapt to a changing climate

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Research Overview

Long-term cover cropping (since 2007)

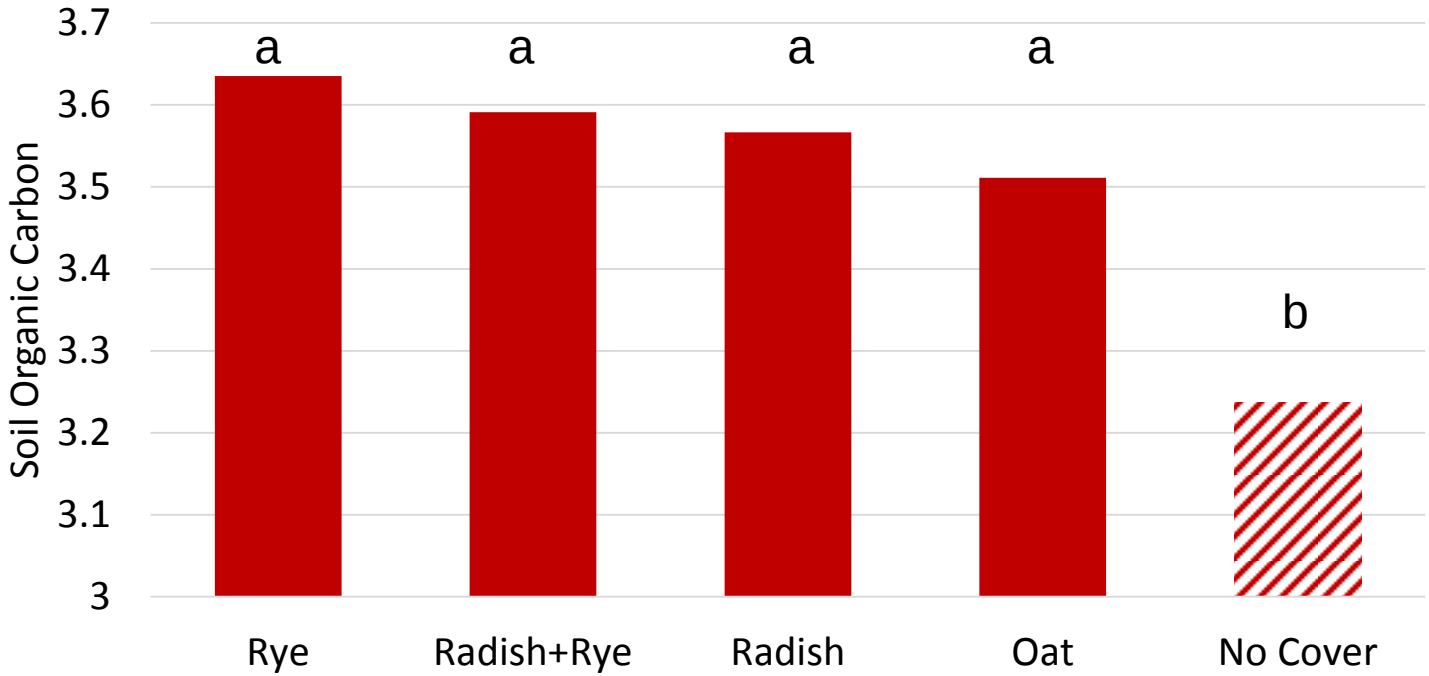
- Systems-based approach (collaborate with economist, soil microbiologist, weed scientist, pathologist, entomologist, nematologist)
- Crop yield and quality
- Nitrogen dynamics (N losses)
- Soil Health (carbon sequestration)

Beneficial to farmers, policy analysts, general public.

Research Methods

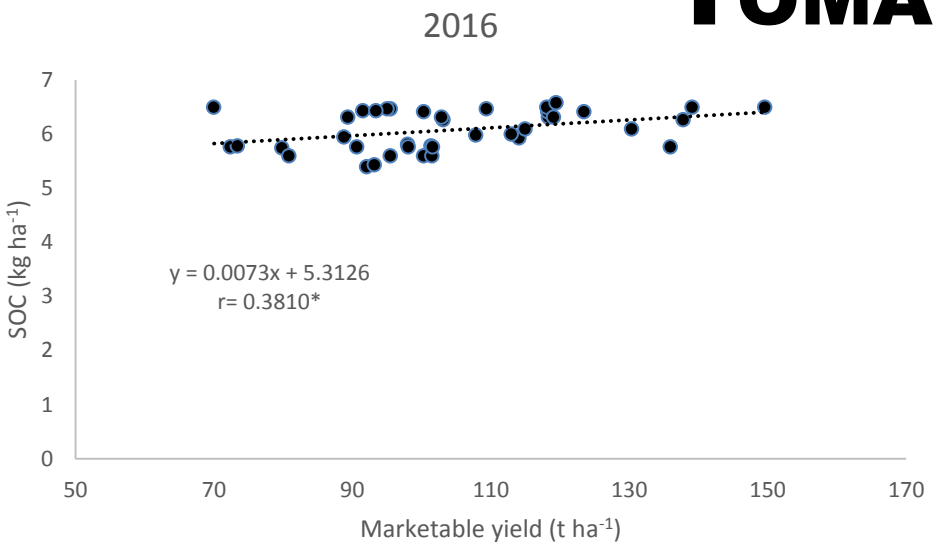
Soil organic carbon

Long-term cover cropping since 2007

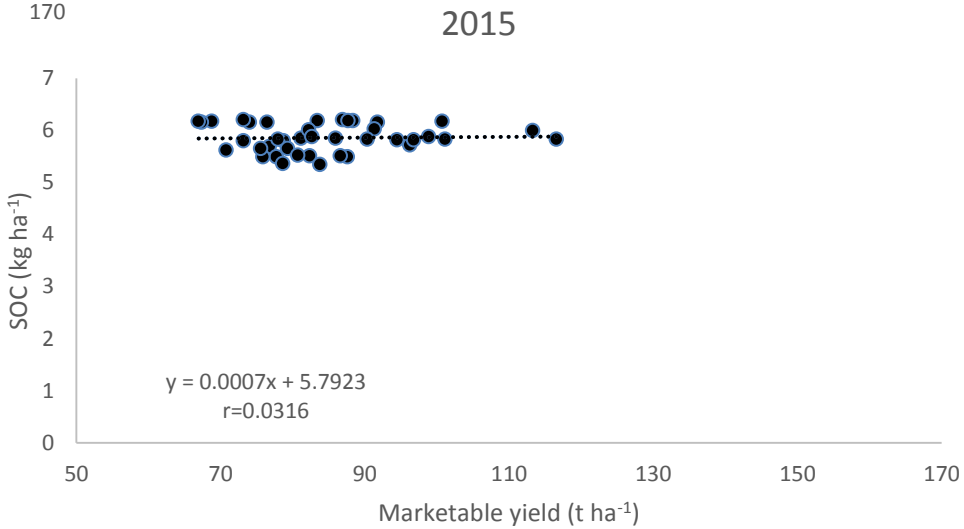


2 trials, all sample dates – unpublished Chahal and Van Eerd

Soil Organic Carbon and Tomato Yield



Hot and dry year
–benefits of soil health show up
–better yields with better soil



unpublished data Chahal and Van Eerd

Summary

Long-term cover crop trials (2007 to 2016)

122 cover crops planted in 20 trials

121 times crop yields were as good as or better with a cover crop than without

Limitations:

Cover crops tested: oat, cereal rye, radish, radish+rye, forage peas, hairy vetch

Crops grown (years): Snap bean (4), sweet corn (6), tomato (4), squash (2), pea (1), wheat (2), grain corn (2), soybean (2), cucumbers (2)

Soil type: Sandy loam with good organic matter

Discussion Topic: How can producers adapt their practices?

- Cover crops only one soil health BMP to potentially mitigate effects of climate change
- Cover crops depend on crop rotation
- Time, management, economic costs to adopting the BMPs immediate
- Potential benefits (not proven) only realized over the long-term

Research Projects

OMAFRA / UofG Partnership –Environmental Sustainability

- UofG2013-1470 Long-term Cover Crop Research: Maintaining and Monitoring Soil Health. Done Apr/17
- UofG2014-1942 Exploring the link between soil biodiversity and soil health using a long term cover crop trial. PI: Kari Dunfield. Started May/15
- UofG2015-2250 Evaluation of BMPs and spectral technology to optimize nitrogen use efficiency in sugarbeet production. Started May/16
- UofG2016-2584 Understanding and Optimizing Nitrogen BMPs for Seed Corn Production with 15N Isotope Tracers. Start Jan/18