

YES!
We can!

Make SOIL
Great Again

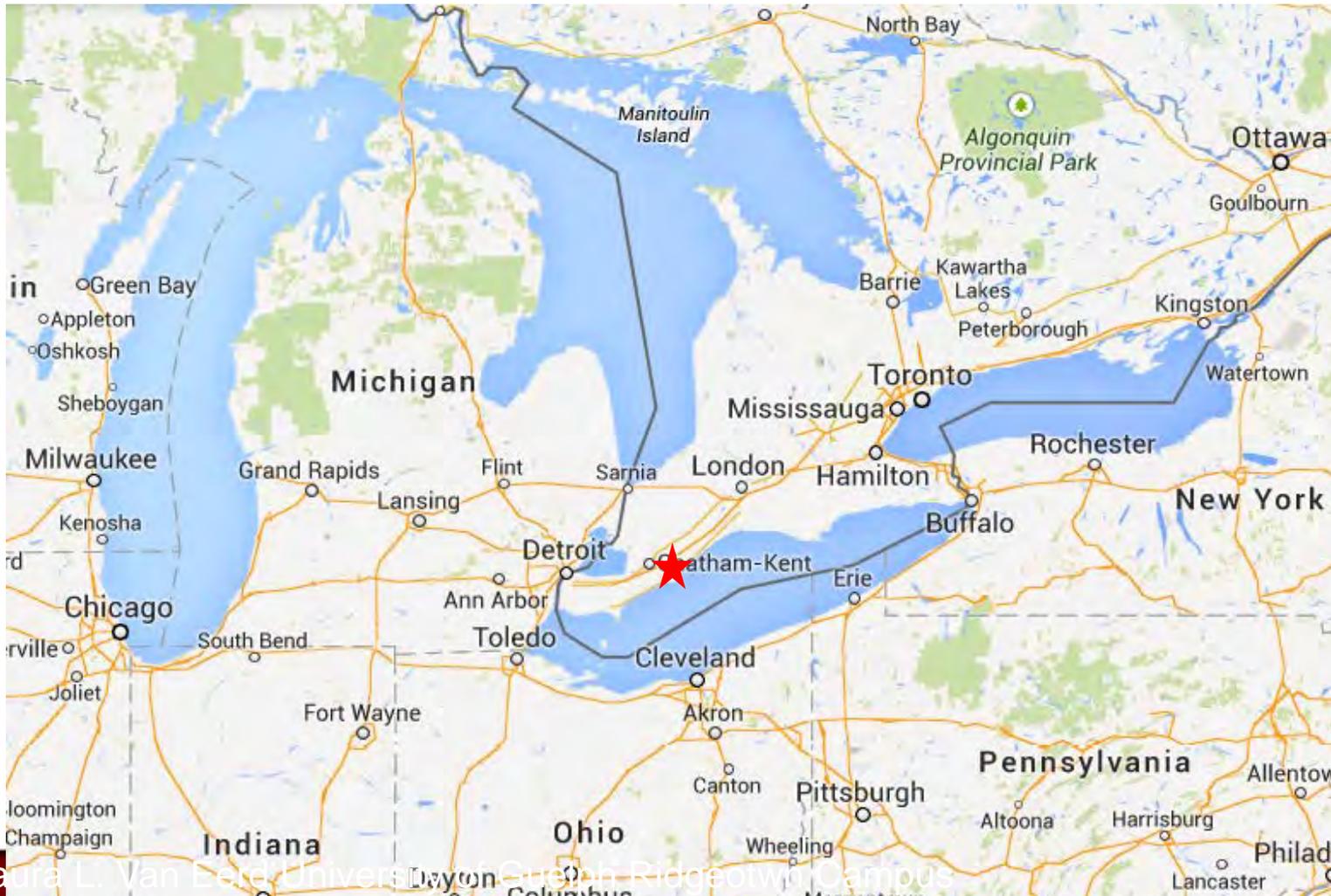


pH	6.3
Soil texture	75:18:7 Sandy loam
% OM	3.5
CEC (cmol kg ⁻¹)	9.4
P (ppm)	52
K (ppm)	248
Ca (ppm)	927
Mg (ppm)	79

Ridgetown, ON

Ave. monthly precipitation = 80 mm

3200 CHU



#1 Cover crop planting date

Started in 2008

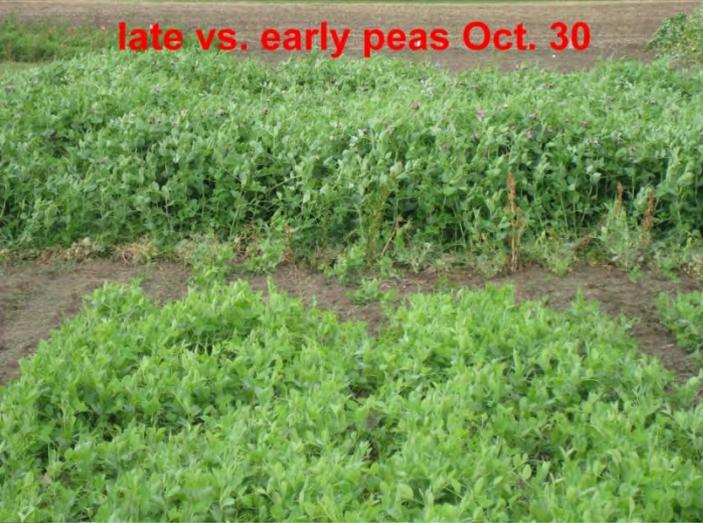
Early (August) vs.

Late (September)

- 1) No cover crop
- 2) Oats 72 lb/ac
- 3) Cereal rye 60
- 4) Oilseed radish 12
- 5) Forage peas 150
- 6) Hairy vetch 25

1: Planting Date Expt.

late vs. early peas Oct. 30



late vs. early radish Oct. 30



late vs. early oats Oct. 30



Trial started 2008

Photo Oct 30th

Early planted -1st-2nd week in August

Late planted -1st-2nd week in September

late vs. early vetch Oct. 30



Vegetable crop yield was not impacted by when the cover crop was planted.

Choose cover crop for your system!

Possible Implications:

- A growing plant more important than how much it grows
- Shows importance of roots

Cover crop growth



August



October



December



May

Main Crop

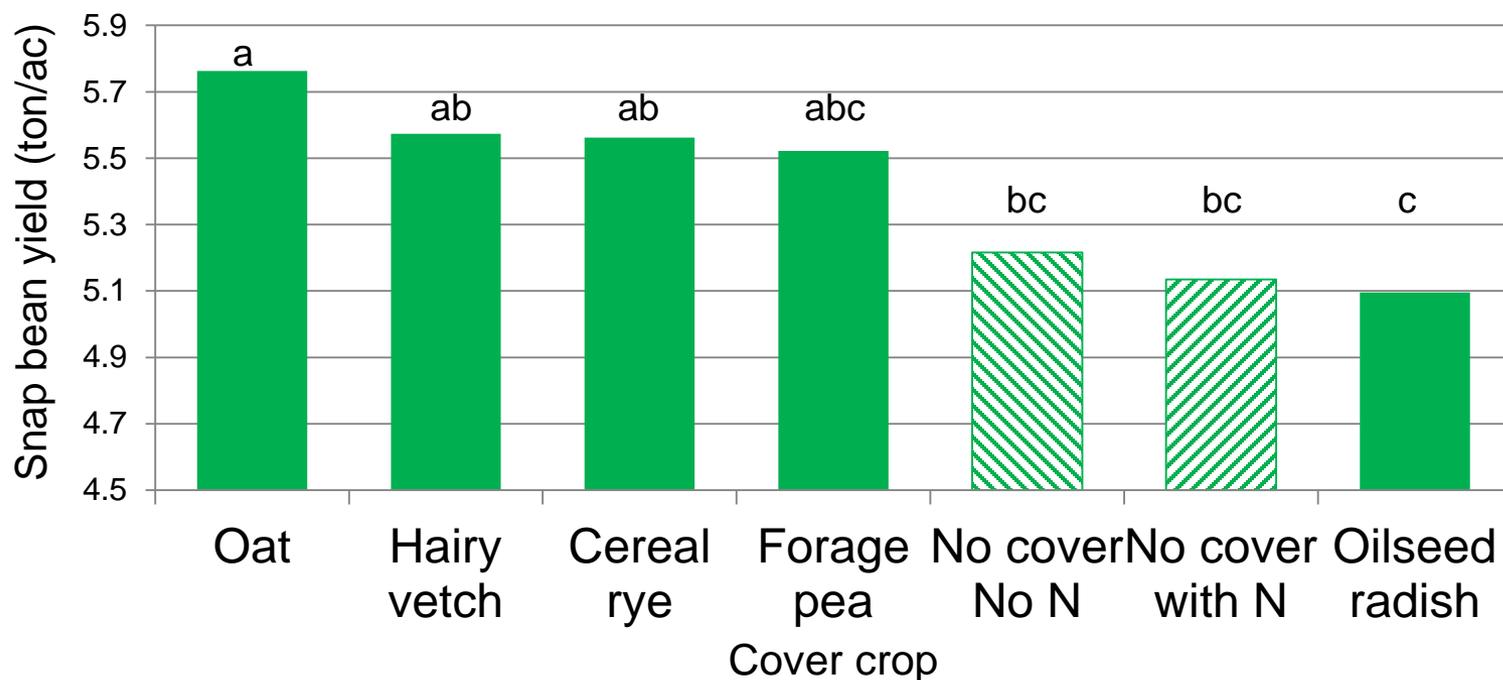
Snap beans

Sweet corn



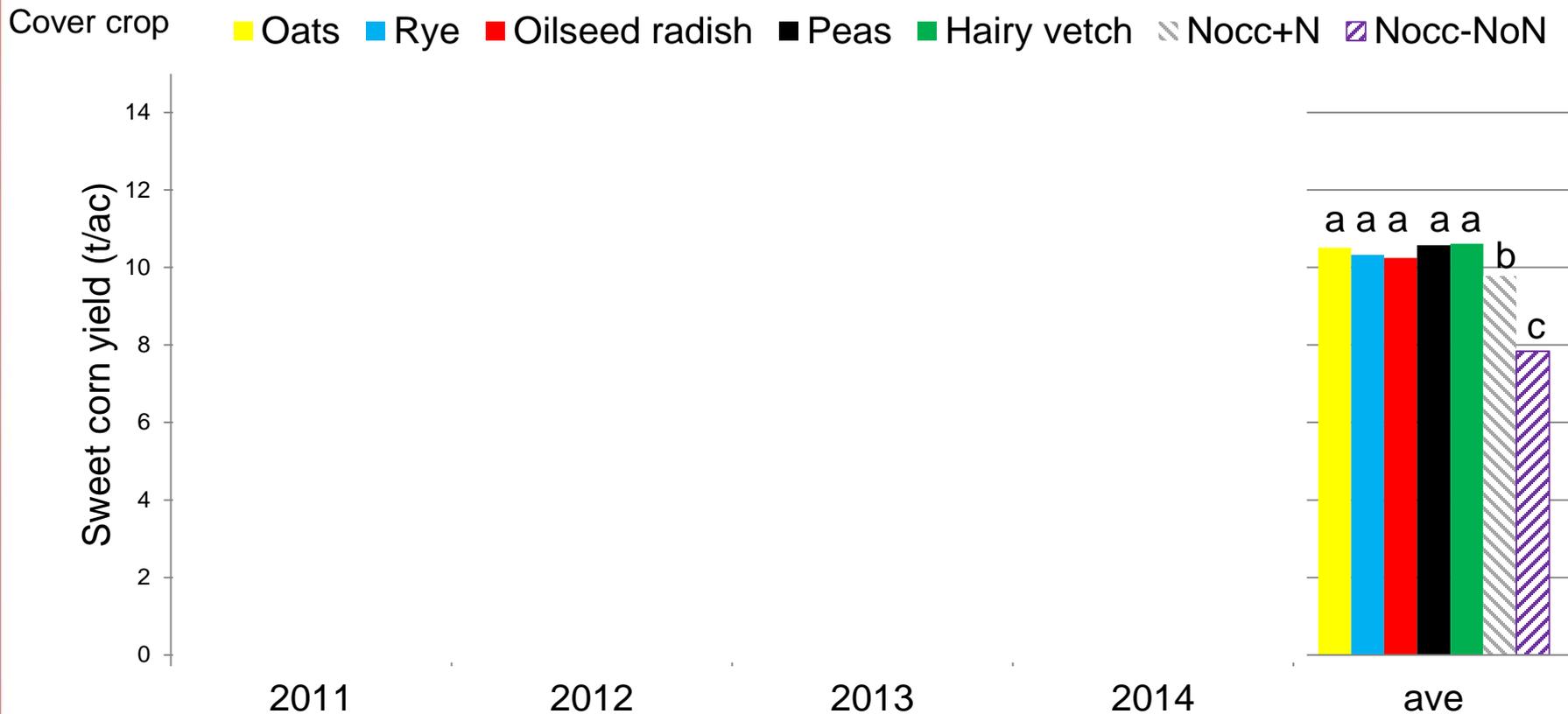
Snap bean yield

Trial established 2008 – same cover crop on same plot
Processing green bean grown in 2011-2014



Sweet corn yield

Trial established 2008 – same cover crop on same plot
Processing sweet corn grown in 2011-2014



Profit Margins

- Revenue from crop yield over costs of cover crop
- Revenue
 - Corn \$90 per ton
 - Snaps \$189 per ton
- Only takes into account costs that vary among treatments
 - Cover crop seed and planting (\$34.25 to \$50 per ac)
 - Herbicide and application (rye only) (\$21.70 per ac)

Economic Analysis by Dr. Richard J. Vyn

Profit Margins

Compared to no cover crop control

Snaps (4 yr ave)

Cover crop	\$/ac
Oats	85.01
Hairy vetch	42.63
Fall rye	37.12
Forage peas	32.82
Radish	-57.65

Sweet Corn (4 yr ave)

Cover crop	\$/ac
Hairy vetch	39.88
Forage peas	35.81
Oats	35.78
Fall rye	No diff
Radish	No diff

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

Cover crops we tested:

Oats, Cereal rye, Radish, Radish+Rye, Forage peas, Hairy vetch

Long-term Cover Crop Trial Summary

Cover crop Recommendation	Veg. crop	# of Trials	Significance Difference
Any	Sweet Corn	6	5 of 6 yrs

Cover crops we tested:

Oats, Cereal rye, Radish, Radish+Rye, Forage peas, Hairy vetch



MCCC - Vegetable Cover Crop Decision Tool Michigan: Grand Traverse County Seeding Dates

Location Information

Cash Crop Information

Soil Information

Attribute Information

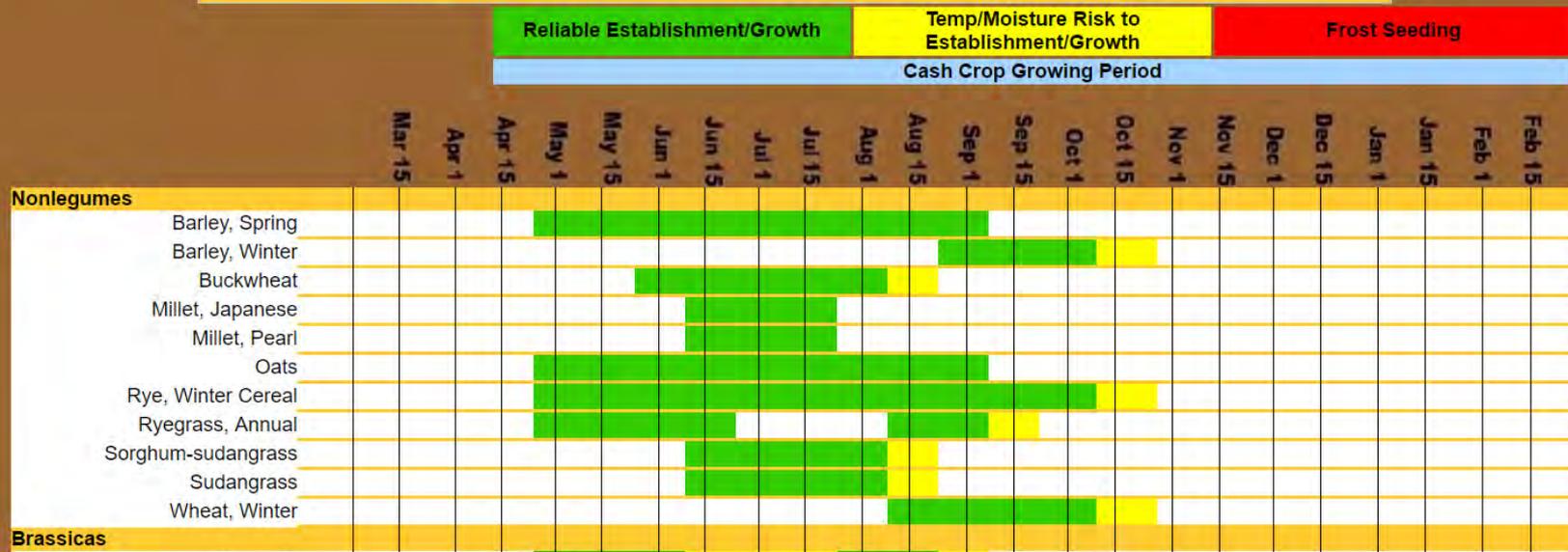
Location Information Michigan Grand Traverse

Cash Crop None or Prevented Planting Plant Date: Harvest Date:

Drainage Information Select a Drainage Class Flooding No

Goal #1 Select an attribute Goal #2 Select an attribute Goal #3 Select an attribute

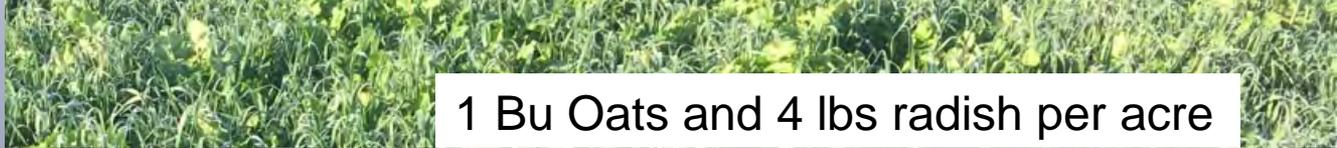
Click on cover crop for further information Barley, Spring Submit





Ku





1 Bu Oats and 4 lbs radish per acre









Soil Health BMPs

Grass Land

**Permanent
cover**

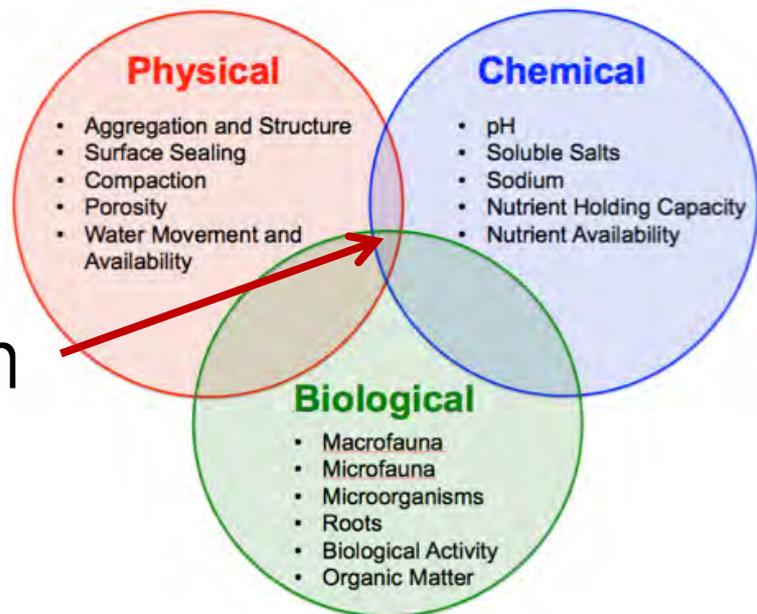
**Organic
Amendments**

Cover Crops

Crop Diversity

Reduced Tillage

Soil health



“Measured by how good a crop you can grow with no inputs at all”

Frederic Thomas



Soil Health

Increased soil organic matter

- Pulling larger machinery with same horse power
- Less ponding/standing water
- 1000 ac of beans in a drought year yielded in mid-60s



2500 ac of no-till and cover crops
corn, soybeans, sugarbeets, winter wheat

Organic Matter vs Organic Carbon

- Soil organic matter
- Soil organic carbon

Soil test report

For: FERTILIZATION
253 JCT. HURON RD.-D
LONDON, ON. N6V 3P5

For:

Report Date: 22/11/99

SOIL TEST REPORT

Page: 1

Sample Number	Lab. Number	Organic Matter (%)	Phosphorus (ppm)	Potassium (ppm)	Magnesium (ppm)	Calcium (ppm)	Sulfur (ppm)	pH	Buffer	CVC	Percent Base Saturations			
			ppm	ppm	ppm	ppm	ppm				% N	% Mg	% Ca	% H
1	3	3.9	141	24 M	136 M	370 M	2550 M	7.5	6.6	17.5	2.0	17.6	72.8	0.7
2	2	4.4	28 M	53 M	185 M	210 M	1000 M	6.1	7.2	7.9	6.1	32.3	63.0	4.6
3	2	2.7	7.4	9 M	94 M	335 M	1400 M	6.0	6.8	12.5	1.0	22.3	50.0	19.2
4	2	2.1	43 M	102 M	130 M	25 M	250 M	4.0	6.8	8.2	4.7	29.4	50.5	1.0

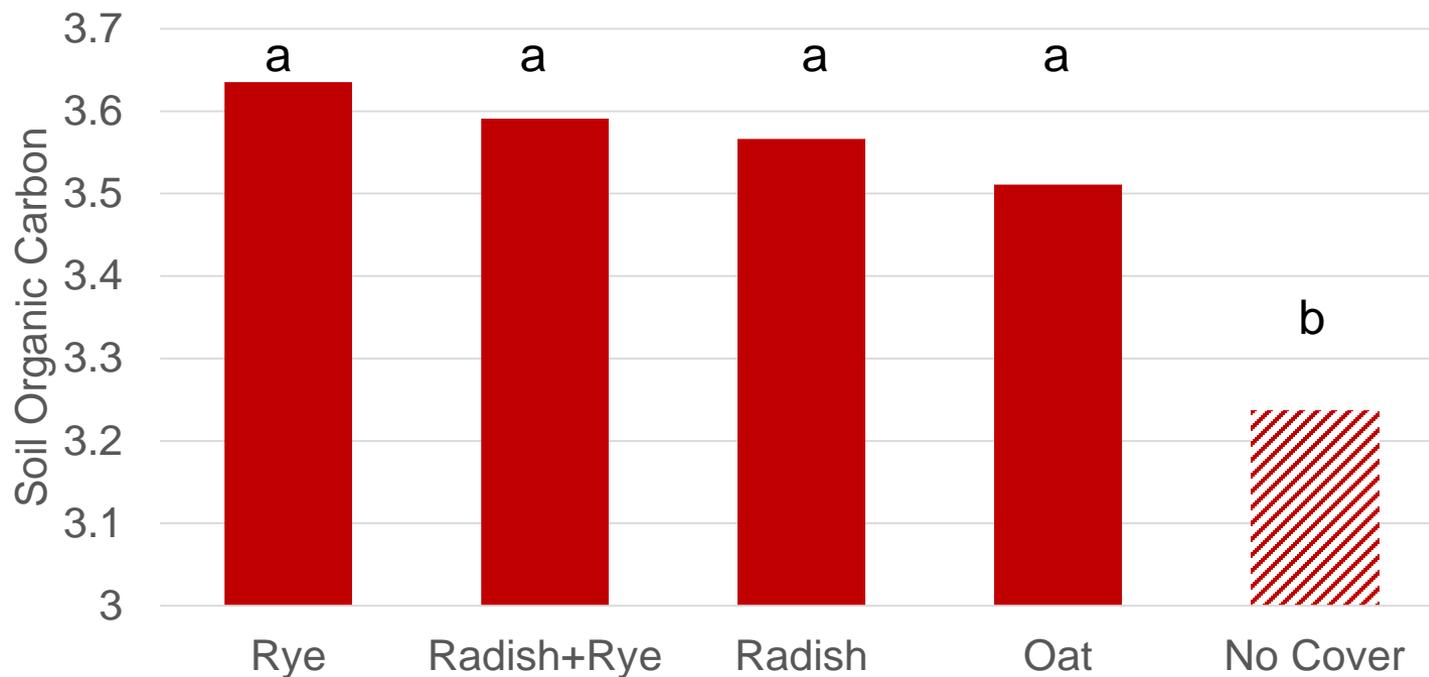
Sample Number	Crop	Yield Goal	Lime Tolerance	N	P2O5	K2O	Mg	Ca	S	Zn	Mn	Fe	Cu	B
1														
2														
3														
4														

Only paid if performed by a laboratory of which a license is held. Not guaranteed or warranted. Intentionally blank cells are marked with a dash (-).

Periodic Table of the Elements

The periodic table displays elements from Hydrogen (1) to Oganesson (118). It is color-coded by groups: Alkali Metals (purple), Alkaline Earths (orange), Transition Metals (yellow), Basic Metals (green), Semimetals (light blue), Nonmetals (blue), Halogens (dark blue), Noble Gases (pink), Lanthanides (light purple), and Actinides (light orange).

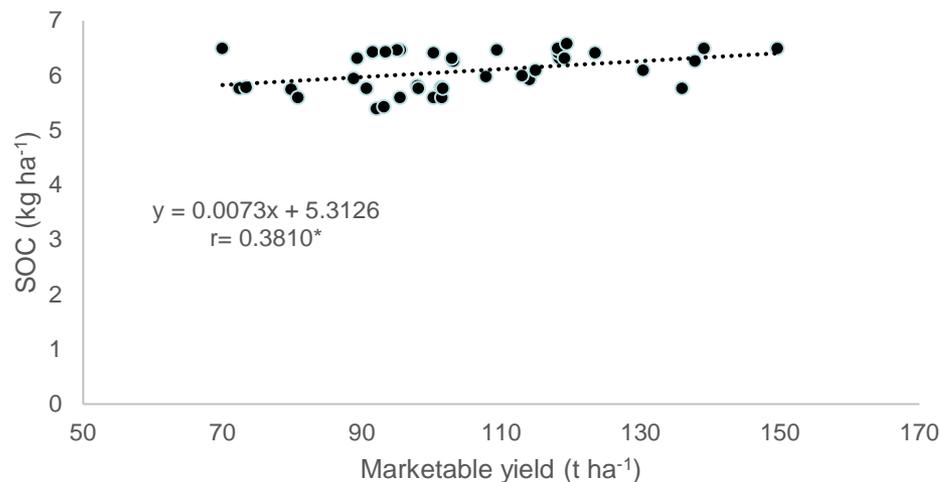
Soil organic carbon



2015+2016 all sample dates –LVE lab

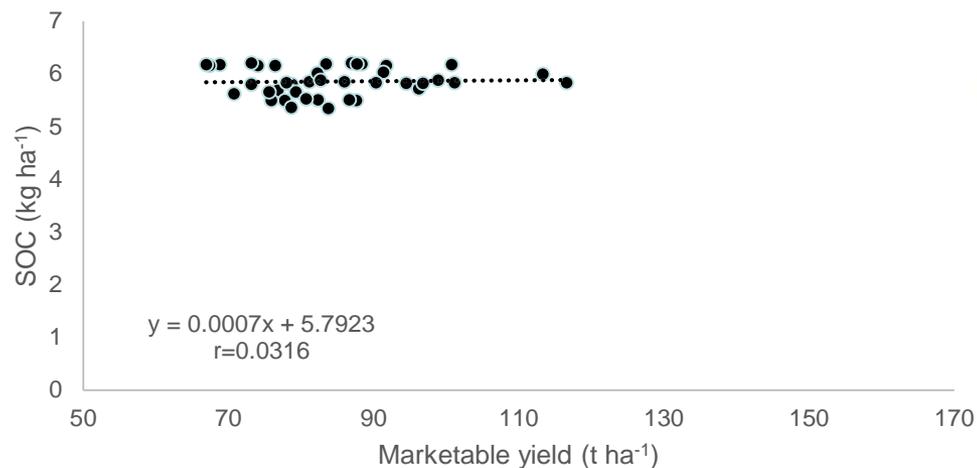
Soil organic carbon and yield

2016



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

2015



Clive's Farming principles

- Always want something growing – would you ever turn off a solar panel ?
- No bare soil – reduce water loss
- Maximize diversity – a varied diet is a healthy diet
- Minimize disturbance, allow biology to thrive and build strong networks
- Feed soil biology buy building SOM
- Improve water infiltration with #rootsnotiron

@TWBfarms