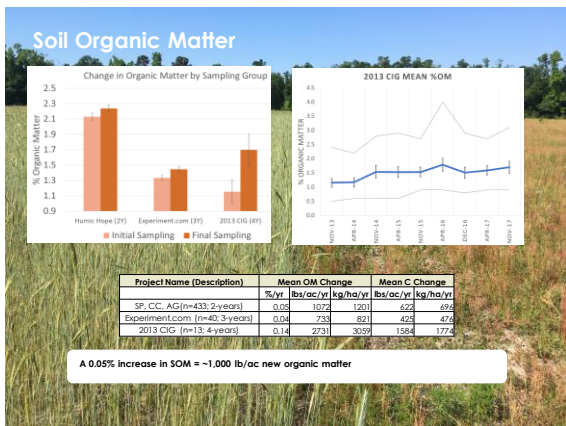


Project	Source	Measuring
How much fertilizer do we really need? (2014- present)	Crowd funded	Yield, Mehlich 1 and Haney, plant tissue
Tillage Plot Demonstration (2015- 2018)	NRCS CIG	Yield, Mehlich 1 and Haney, plant tissue
Aflatoxin Project (2016- present)	NRCS CIG	Yield, Mehlich 1 Haney, PLFA, plant tissue, soil moisture, mycotoxins
Metagenome and Tillage (2016-present)	USC Internal	Yield, Mehlich 1 and Haney, plant tissue, Soil DNA
Cover 5 (2017-present)	NRCS	Mehlich 1 Haney, PLFA, plant tissue
Compost on Turfgrass (2018-present)	Crowd funded	NDVI, Mehlich 1 Haney, PLFA, plant tissue, direct microscopy



Yields, yields, yields

Com-wheat-soybeans (4yrs, 6 crops) – with and without K2O in a cover cropped field
Medium soil test K, 10 side-by-side plots each TRT

	Wheat '15	Soybeans '15	Com '16	Wheat '17	Soybeans '17	Com '18	Total Bu*
Rx K2O	50	41	144	51	64	93	442
Zero K2O	51	41	147	48	64	102	454

* No significant difference

Yields, yields, yields

2017/18 Corn Yield Side by Sides – Cover vs. No Cover¹

Year	Location	Corn Yield (bu/ac) W. Cover	Corn Yield (bu/ac) No Cover	Ave %OM	Irrigated?
2018	Dillon, SC	170	160	3.5	N
		150	121	2.1	N
		241	178	1.2	Y
2018	Eastover, SC	173	240	4.8	Y
		232	199	1.3	Y
		246	248	1.8	Y
2017	Eastover, SC	135	155	1.7	N
		189	159	1.8	Y
		160	141	1.2	Y

Averages	Cover	No Cover
Dillon 2018 (n=4)	160	140
Eastover 2018 (n=8)	223	216
Eastover 2017 (n=6)	161	152
Overall Ave*	188	178

* No significant difference
However, 6 out of 7 plots with covers out-yielded no cover

1. Data from 2 NRCS Conservation Innovation Grants:
a. "Determining the Role and Cover Crop Management Strategies on a Corn-soybean Rotation Behavior" (Dillon, SC)
b. "Using Cover Crops and Soil Health to Reduce Crop Stress and Aflatoxin Contamination" (Eastover, SC)

Soil Moisture at 0-8" Cover vs. No Cover

NRCS CIG: "Using Cover Crops and Soil Health to Reduce Crop Stress and Aflatoxin Contamination (Eastover, SC)"

5 NT vs CC Plots 2018

Dry biomass 5,100 lbs

Clemson	Cover	No Cover	Stat Diff?
pH	6.8	6.6	x
P	1.64	1.74	x
K	270	268	x
Mn	26.8	22.8	x
%OM	2.28	2.36	x

Cover Biomass and Plant Tissue	
Nutrient Content in Cover (n=5)	lb/ac
N	131
P	21
K	161

Soil Tests

NRCS CIG: "Using Cover Crops and Soil Health to Reduce Crop Stress and Aflatoxin Contamination (Eastover, SC)"

5 NT vs CC Plots 2018

Honey Test ppm (Ward Labs)			
	Cover	No Cover	Stat Diff?
CO2-C	26	28	x
Water Xtr Organic N	14	15	x
Nitrate	4.3	14.9	√
H2O Total Organic C	160	138	√

Soil Tests PLFA ng/g (Ward Labs)			
	Cover	No Cover	Stat Diff?
Total Biomass	3902	2822	√
Bacteria Biomass	1839	1336	√
Fungal Biomass	402	184	√
AMF Biomass	103	57	√
Fungi:Bacteria	0.22	0.14	√
Predator:Prey	0.015	0.005	√

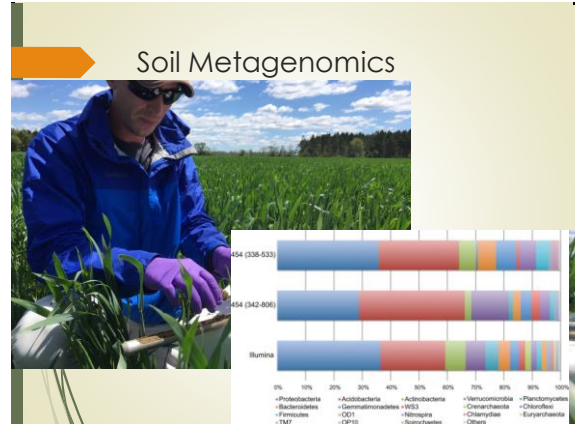
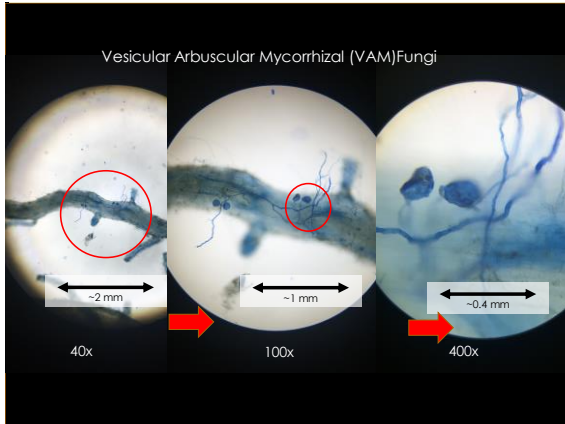
Mycotoxins		
	Cover	No Cover
Fumonisin B-1 (ppm)	3.2	7.0

NRCS CIG: "Using Cover Crops and Soil Health to Reduce Crop Stress and Aflatoxin Contamination (Eastover, SC)"

Microscopic images showing soil organisms, including nematodes and bacteria.

Microscopic images showing soil organisms and a scatter plot comparing Ward Labs PLFA results to direct microscopy.

Ward PLFA vs Direct Microscopy



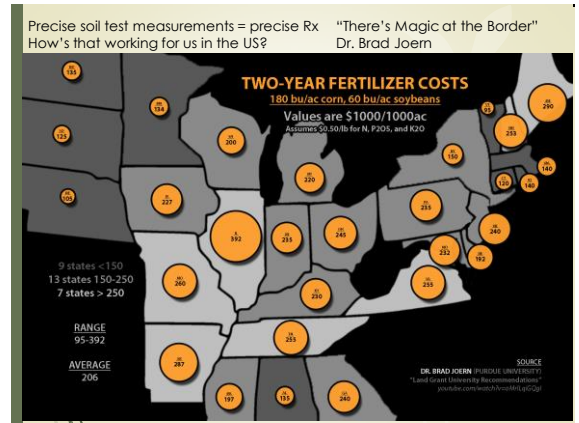
My biggest mistake

- Lousy cover crop = lousy hydrologic function, subsoiling will help in front of corn when covers are lousy

How are Covers saving/making us Money?

- Reduced inputs (tillage/fertilizer, herbicide, pesticide) ~\$40-\$70/ac?
- 2018 - Yields - anecdotal (With covers and lowest inputs yet)
 - (1) Attribute to (mostly) improved Hydrologic Function
 - Increase in %OM > Increase in AWC
 - Lower Evapotranspiration (armor)
 - Improved soil structure
 - Improved Infiltration, Increase soil moisture (dry), better drainage (wet)

Most Important: Changing the way the Farmer Sees



Yields, yields, yields

2017/18 Corn Yield Side by Sides - Cover vs. No Cover¹

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* No significant difference
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1. Data from 2 NCS Conservation Innovation Grants:
a. Covering Tillage and Cover Crop Management Strategies on a Conservation Reserve Program (CRP) Site, SC
b. Using Cover Crops and Soil Health to Reduce Crop Stress and Alleviate Contamination (Eastover, SC)