



Managing Your Farm With The Soil Health Principles



**By: Jay Fuhrer | Soil Health Specialist | Bismarck, ND - USA
Natural Resources Conservation Service - USDA**



Canola

**Menoken Farm
Cover Crop 100% Cereal Rye.
Avoided The Brassica Family
Due To Clubroot And Blackleg.
September 2017**

**Evaporation Costs Us Something
Transpiration Buys Us Something**



**Menoken Farm
Planting Canola Green
May, 2018**



**Menoken Farm
Canola - June 11, 2018
Managing Water Quantity
With The Termination Date.**



Insect Impacts Canola And Cover Crops June 11, 2018

No Cover Crop



Cover Crop



Menoken Farm
Canola – End Of June, 2018



**Menoken Farm
Canola – July 5, 2018**



Soybean

**Menoken Farm
Planting Soybean Green
Spring 2018**



**Menoken Farm
Soybean Planted Green
June 11, 2018
Managing Water Quantity
With The Termination Date.**



**Menoken Farm
Soybean Planted Green
July 5, 2018**



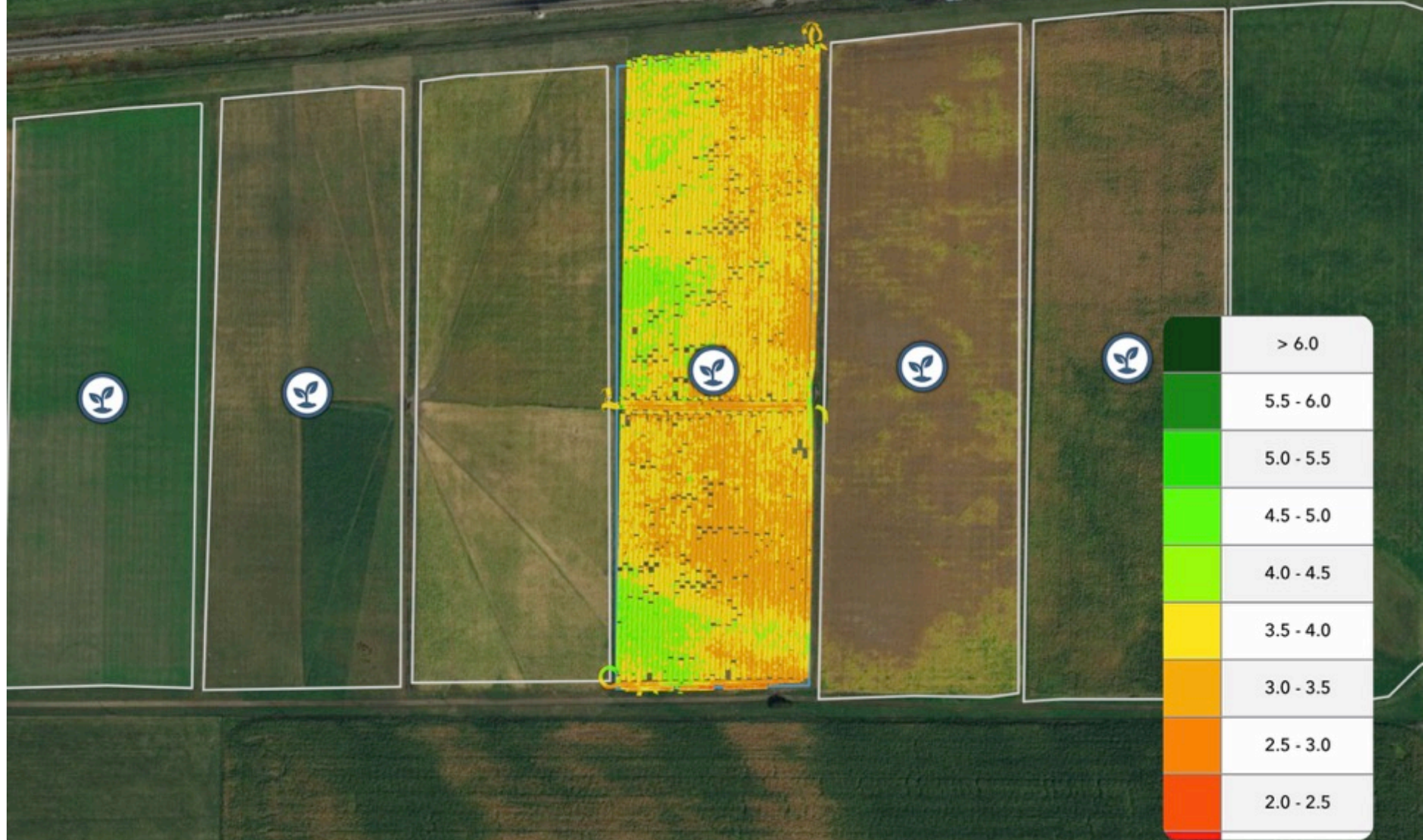
Menoken Farm
Soybean Planted Green



Menoken Farm
Soybean Planted Green



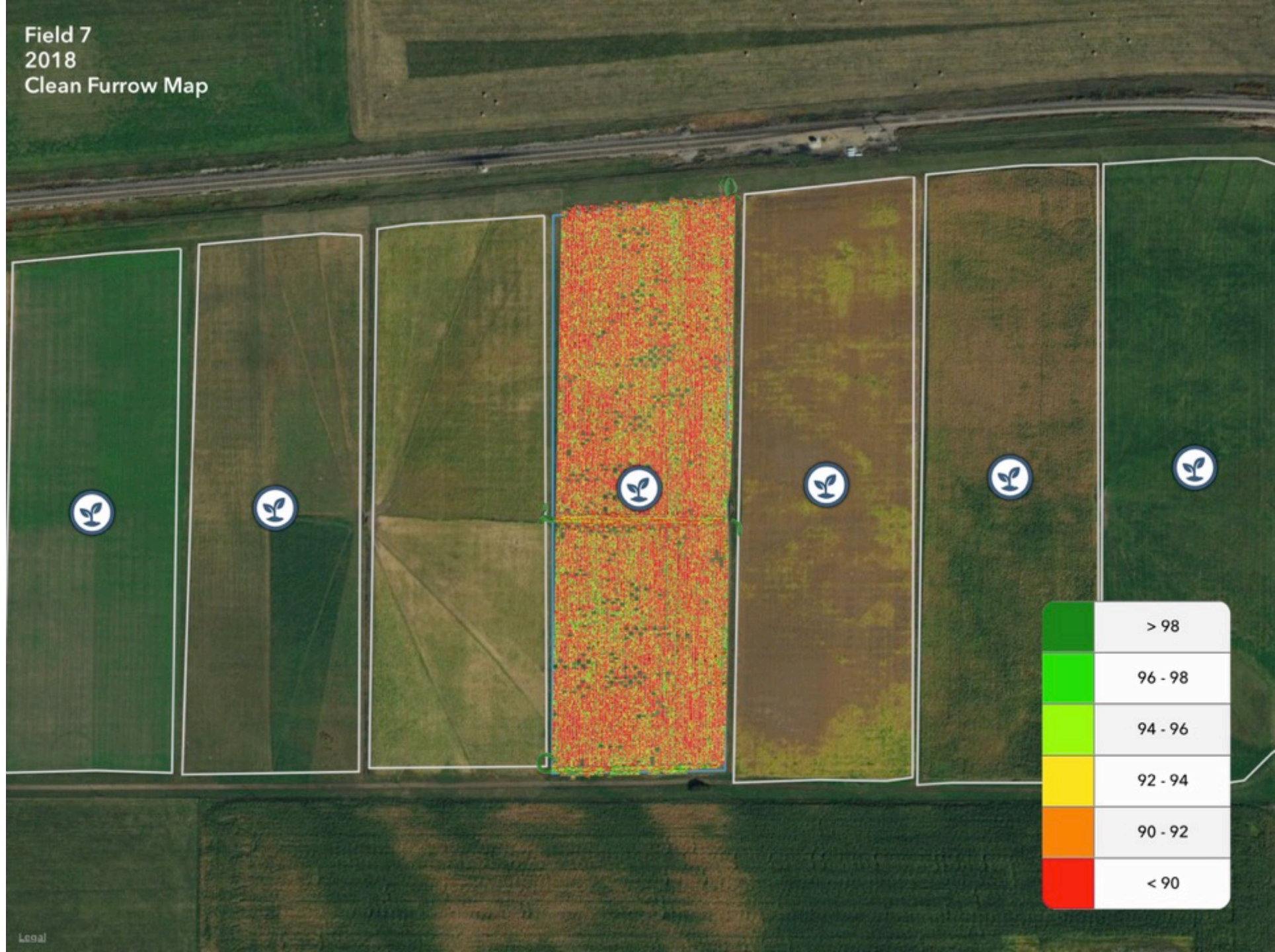
Field 7
2018
Organic Matter Map



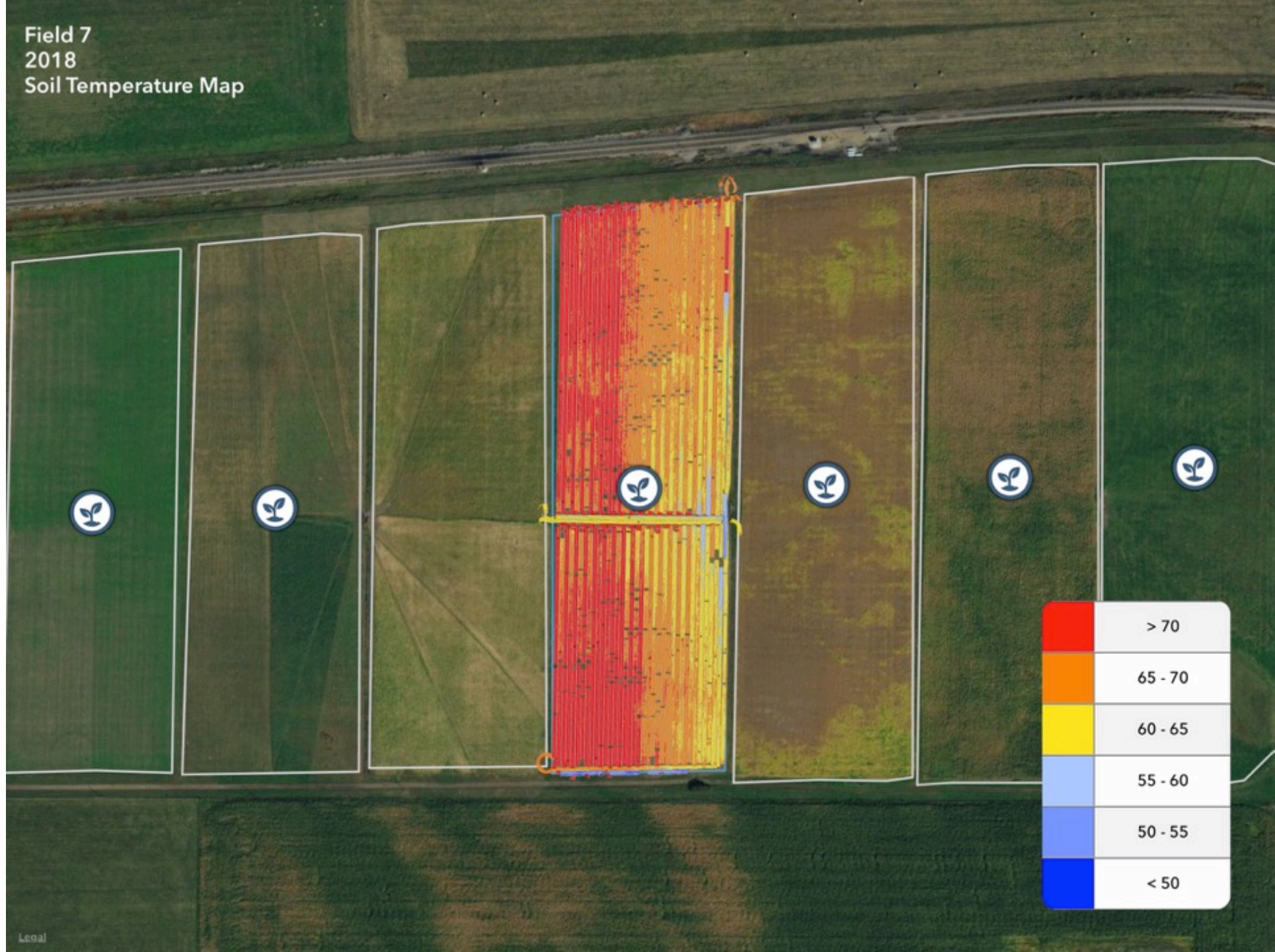
Field 7
2018
Down Force Map



Field 7
2018
Clean Furrow Map



Field 7
2018
Soil Temperature Map



Nurture Nature With System Synergies



No Tillage

Minimum Carbon Loss



Cover Crops

Maximum Carbon Input

Carbon management

Sustainability

Dr. Don Reicosky
ARS, Morris, MN

Covers Seeded After Wheat Harvest Menoken Farm



Covers – Annuals and Gardening



**Menoken Farm High Tunnel
Cover Crops - Fall of 2018**



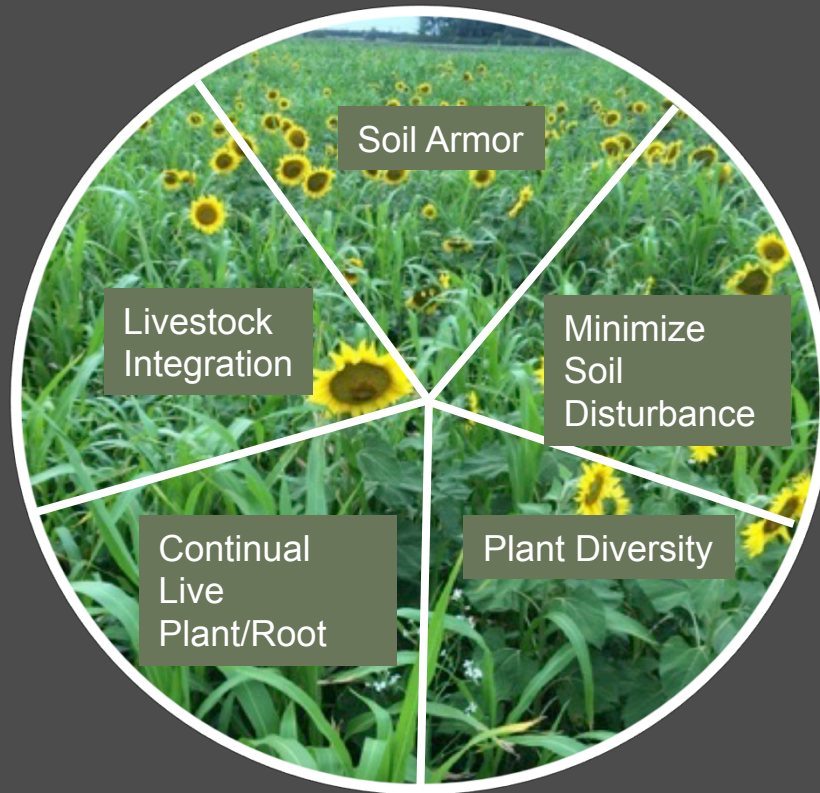
**Menoken Farm High Tunnel
Terminating Cover Crops - Spring of 2019**

Menoken Farm
High Tunnel
Preparing for Spring Planting



Menoken Farm
High Tunnel
10 Days No Sunlight





Soil Health Principles

Systems Approach

Soil Health: the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.

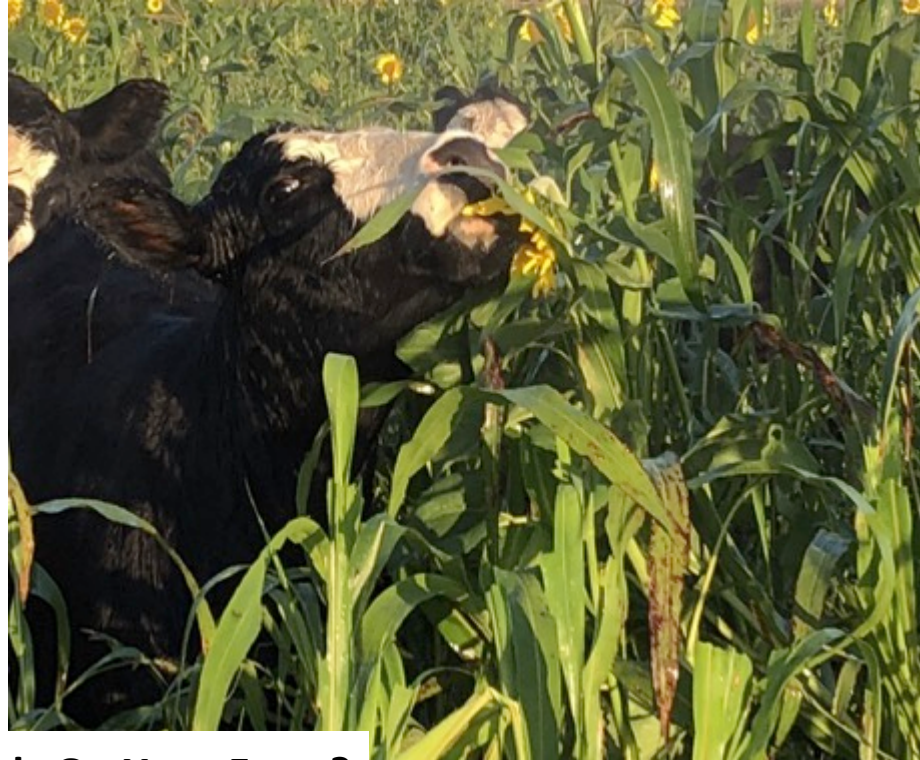
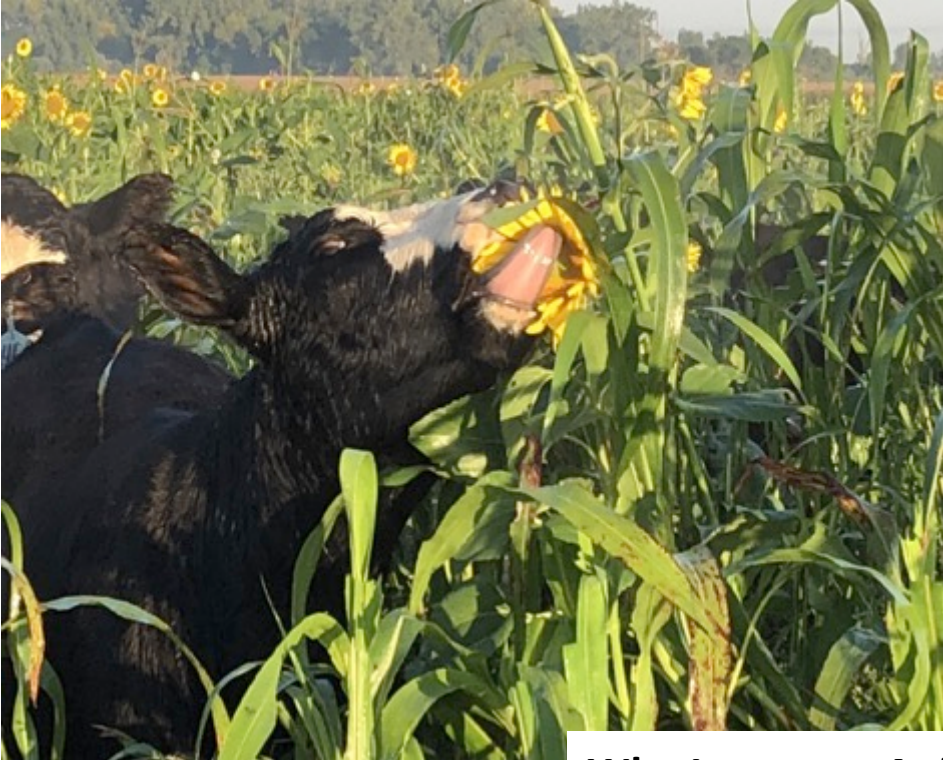
Covers – Annuals And Grazing



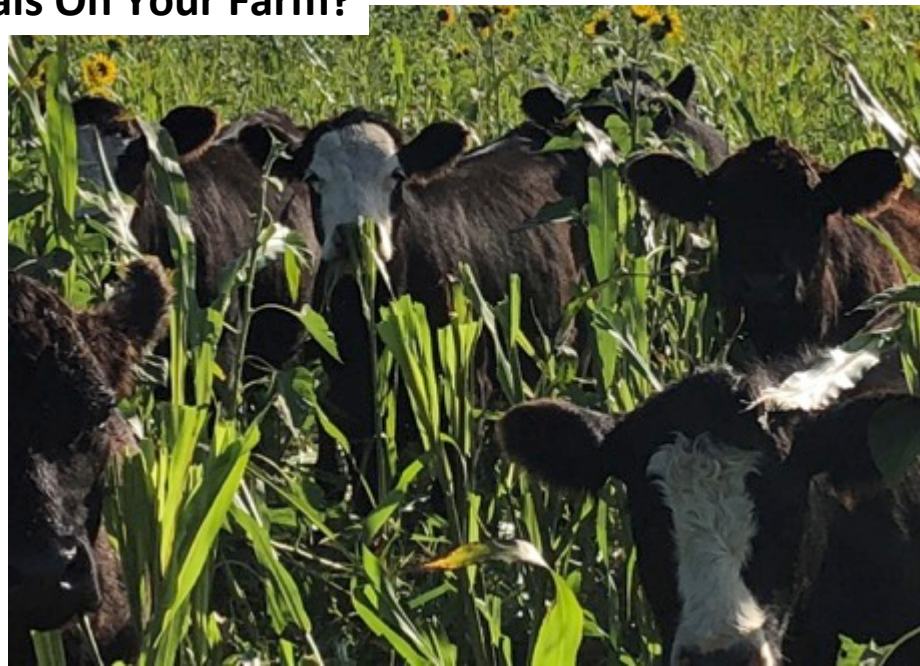
**Clipping Frames and
Averaging Production,
Prior to Grazing.**

**Warm Season Cover Crop Mixture
9000 lbs/ac (10,080 kg/hectare
Menoken Farm**





Why Integrate Animals On Your Farm?





Menoken Farm
Grazing Corn



Menoken Farm September 2019

- They Convert High Carbon Material To Low Carbon Material, Feeding The Soil Food Web.
- They Spread Biology When They Walk And Graze.
- The Manure Is A Home And Food For Dung Beetles And Mites, And Later The Caverns Are Used By Other Insects.
- Animal Impacts From Trampling Organic Material To The Soil Surface.
- Plants, Soils, And Animals Evolved Together Over Geological Time.

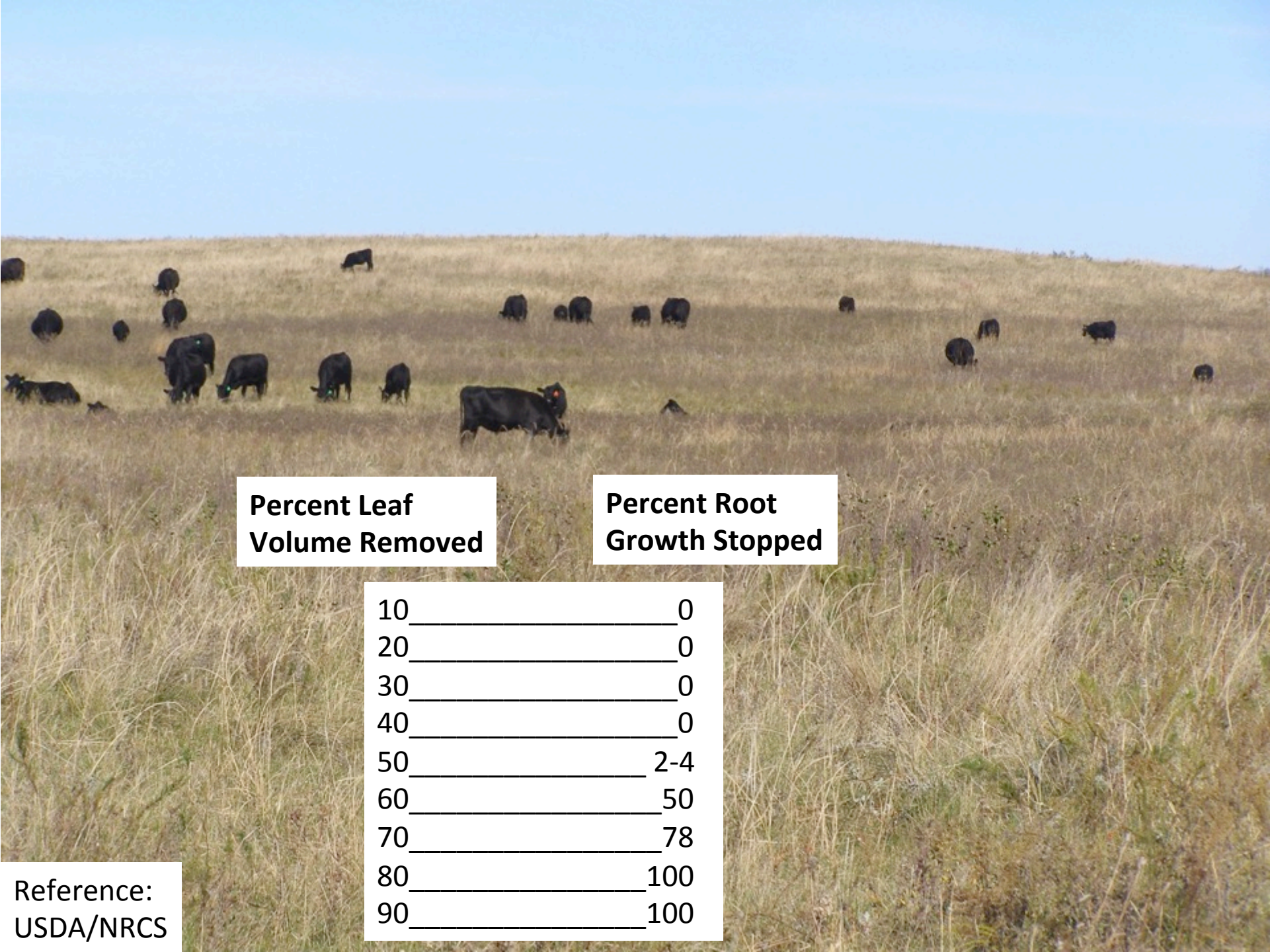
Menoken Farm
Covers & Cows



Cover Crop Feed and Forage Report			
Menoken Farm			
19-Sep-16			
Specie	Crude Protein	RFV	TDN
Annual Ryegrass - Top/half	15.67%	110.81	61.88%
Annual Ryegrass - Bottom/half	8.02%	109.05	60.12%
Cowpea - Top/half	14.79%	218.90	69.38%
Cowpea -Bottom/half	4.35%	103.72	58.94%
Hairy Vetch - Top/half	14.75%	126.74	60.78%
Hairy Vetch - Bottom/half	6.07%	85.59	52.08%
Pearl Millet - Top/half	9.77%	83.95	59.18%
Pearl Millet - Bottom/half	1.77%	86.91	57.79%
Radish - Top/half	10.74%	105.20	56.08%
Radish - Bottom/half	6.54%	75.30	48.09%
Soybean - Top/half	17.90%	190.15	67.95%
Soybean - Bottom/half	11.76%	114.08	59.10%
Sudan - Top/half	7.83%	83.93	58.21%
Sudan - Bottom/half	7.52%	84.78	57.56%
Sunflower - Top/half	10.38%	193.66	65.57%
Sunflower - Bottom/half	6.06%	123.83	58.30%
Sweet clover - Top/half	24.53%	228.51	72.25%
Sweet clover - Bottom/half	12.62%	97.47	55.15%
Cool Season Cover Crop Mix (fall seeded)	26.79%	208.43	71.32%
Source: Dairyland Laboratories, Inc.			



**Menoken Farm – August 2019
Graze The Top Half And Trample The Bottom Half**



**Percent Leaf
Volume Removed**

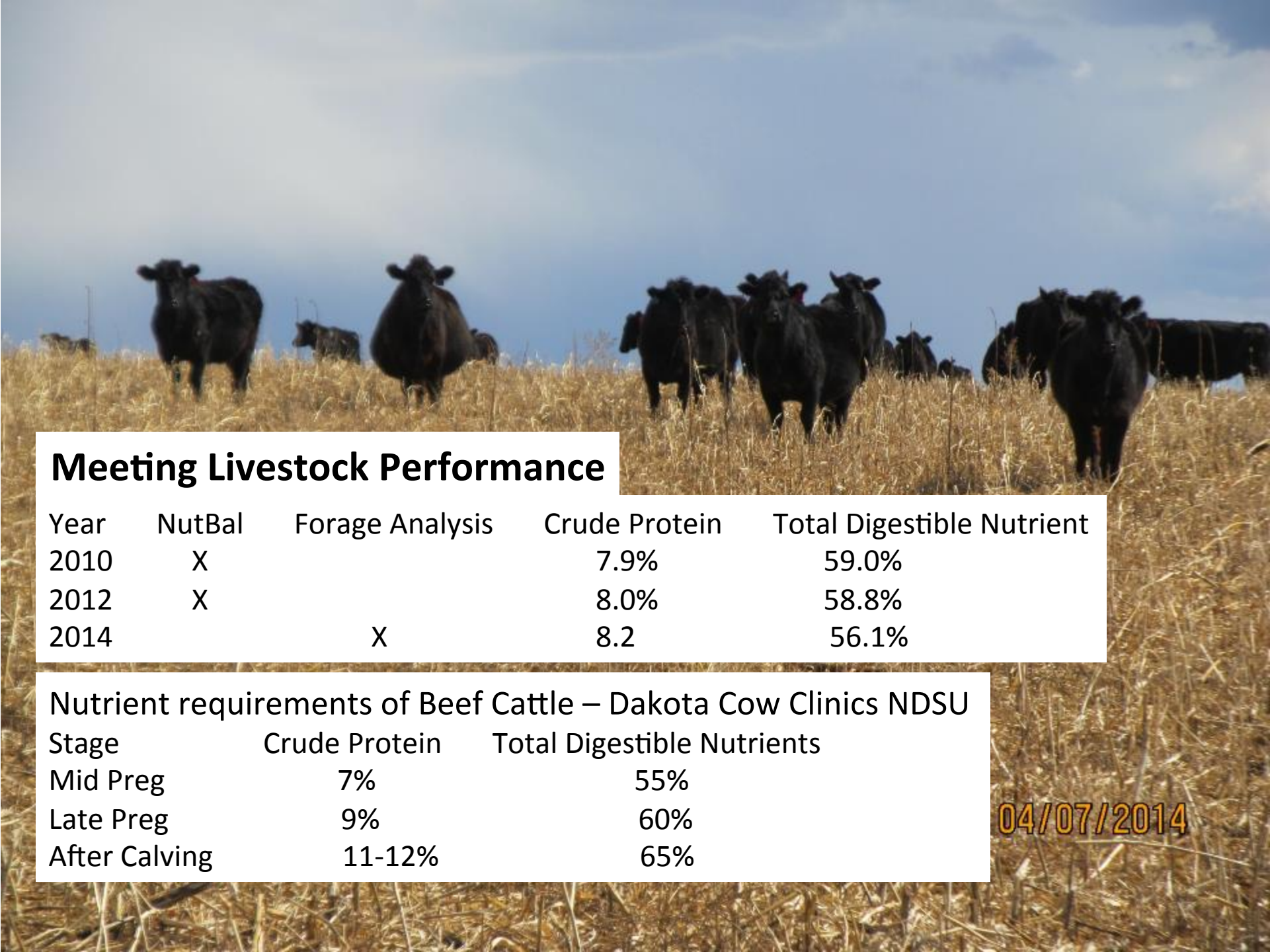
**Percent Root
Growth Stopped**

10	0
20	0
30	0
40	0
50	2-4
60	50
70	78
80	100
90	100

Reference:
USDA/NRCS

Armor After Grazing Menoken Farm - 2018





Meeting Livestock Performance

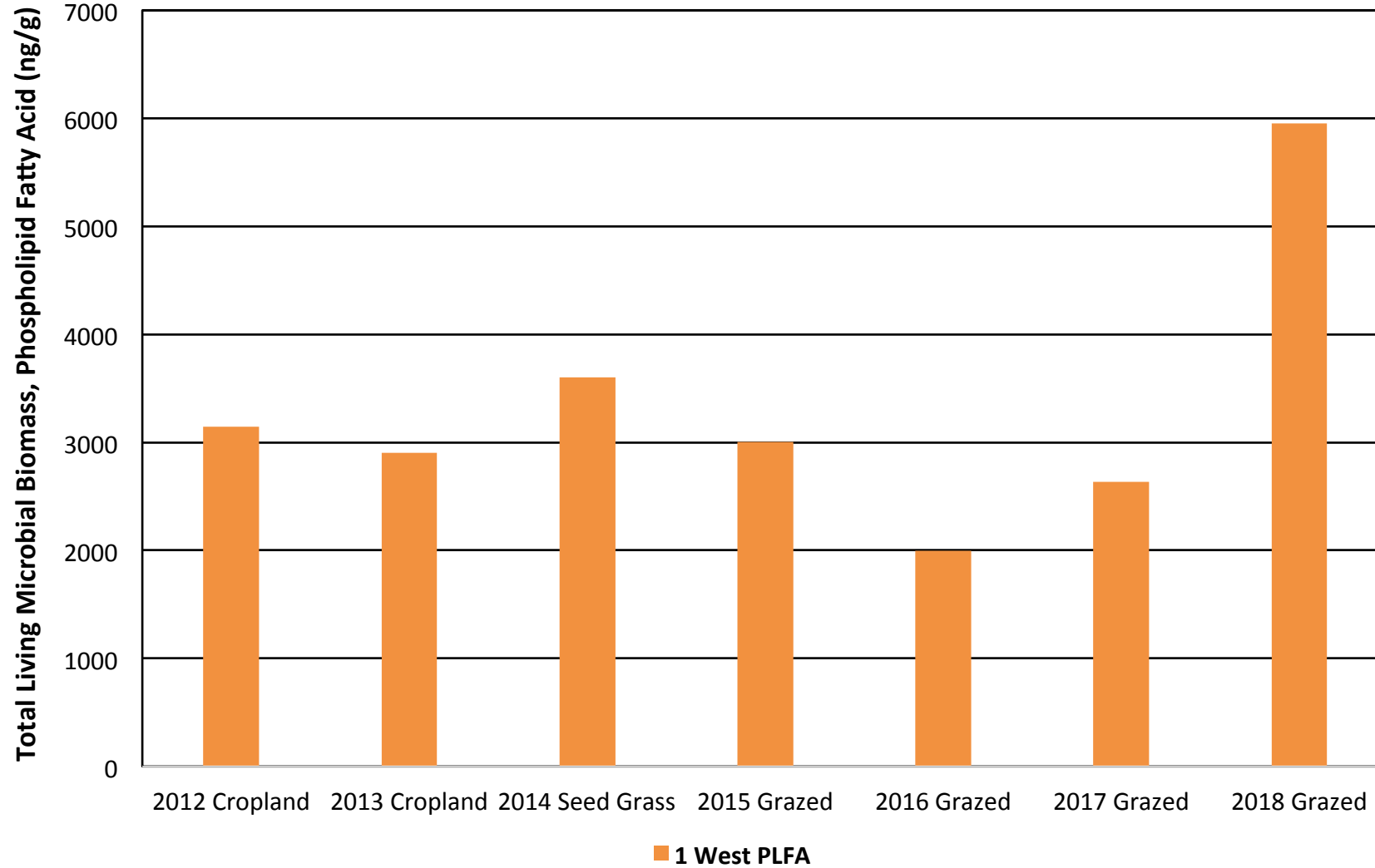
Year	NutBal	Forage Analysis	Crude Protein	Total Digestible Nutrient
2010	X		7.9%	59.0%
2012	X		8.0%	58.8%
2014		X	8.2	56.1%

Nutrient requirements of Beef Cattle – Dakota Cow Clinics NDSU

Stage	Crude Protein	Total Digestible Nutrients
Mid Preg	7%	55%
Late Preg	9%	60%
After Calving	11-12%	65%

04/07/2014

Grazing Impacts on Soil Food Web



Menoken Farm

Menoken Farm

Soil Monitoring – 5 Years

Field 1

Base Saturation

Year	pH	SOM	H	K	Ca	Mg	Na
10/12	5.8	2.8	36	4	45	15	0
12/17	6.8	3.2	0	8	63	28	1

H	0-5%	2013 Cropland
K	1-7%	2014 Seed to Grass
Ca	65-75%	2015 Graze
Mg	15-20%	2016 Graze
Na	0-5%	2017 Graze

Menoken Farm
Rotational Perennials
Going into Winter Strong





**Find ways to increase soil
organic carbon, and soil
health will follow.**

Dr. Don Reicosky
ARS-Morris, MN



Self Education

- A Soil Owner's Manual: by Jon Stika
- Growing A Revolution: by David Montgomery
- Dirt to Soil: by Gabe Brown
- Forty Chances: by Howard Buffett
- Humus Chemistry: by F.J. Stevenson
- Soil Microbiology, Ecology, and Biochemistry: by Eldor Paul
- The Soil Will Save Us: by Kristin Ohlson
- The Nature and Properties of Soils – 14th Edition : by Brady and Weil
- Journals of Lewis and Clark
- Buffalo Bird Women's Garden : by Gilbert Wilson
- The One Straw Revolution: by Masanobu Fukuoka
- Managing Cover Crops Profitably 3rd Edition
- A Sand County Almanac: by Aldo Leopold
- Soil Biology Primer: by Elaine Ingham
- Life in the Soil: by James Nardi
- An Agricultural Testament: by Sir Albert Howard
- Dirt – The Erosion of Civilizations: by David Montgomery
- Early Settlement of North Dakota: by Clement Lounsberry
- 1491: by Charles Mann
- Civilization Critical: by Darrin Qualman

www.menokenfarm.com

Click on the Learn tab.

YouTube Channel

Menoken Farm.



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NRCS/USDA
<https://www.nrcs.usda.gov/wps/portal/nrcs/site/nd/home/>

Menoken Farm
<http://menokenfarm.com/>



Natural Resources
Conservation Service

USDA IS AN EQUAL OPPORTUNITY PROVIDER, EMPLOYER, and LENDER


Extra Slides







Planting Green

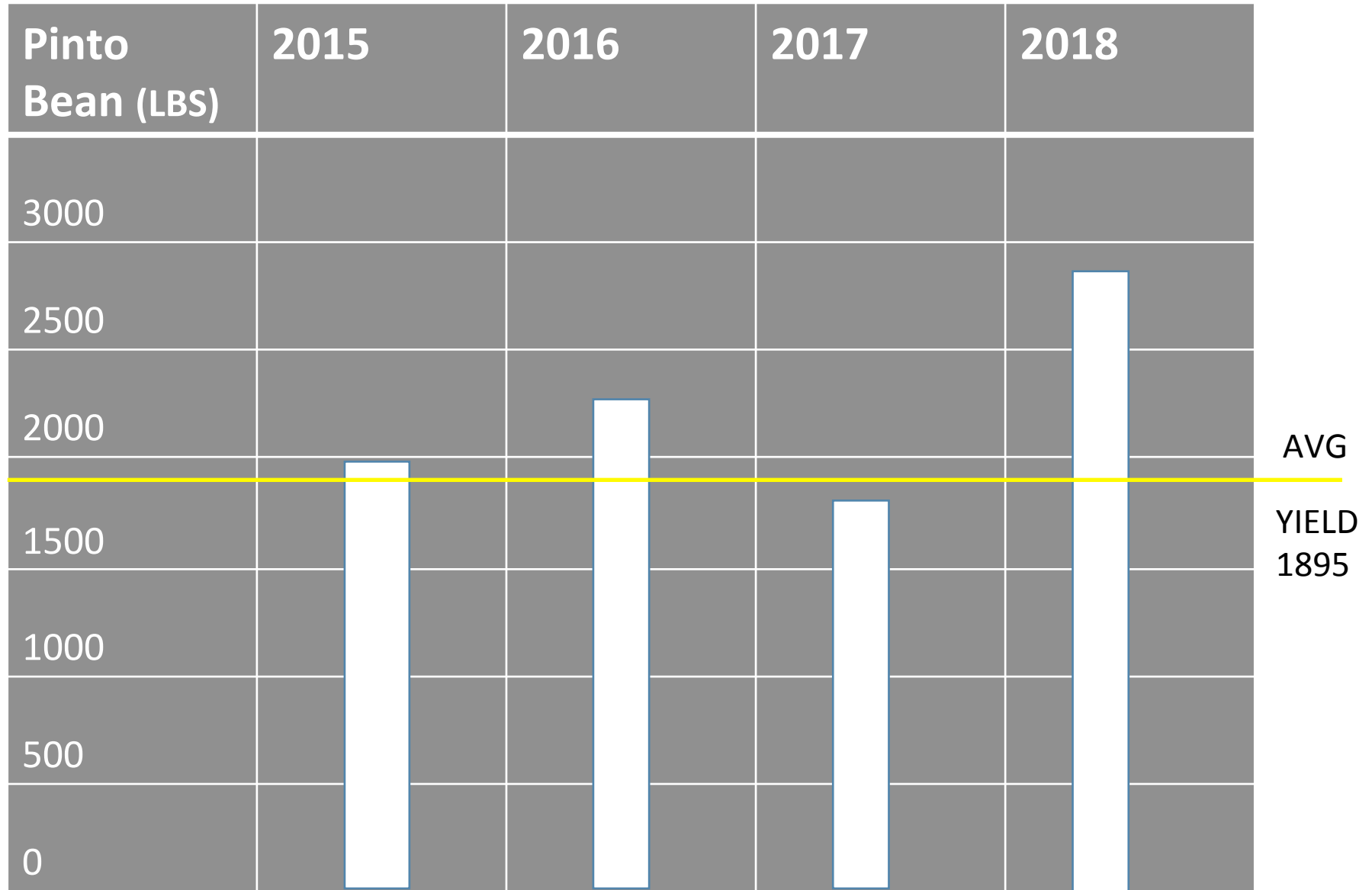
A first-person perspective from the driver's seat of a tractor in a vast green field. The tractor's hood and steering wheel are visible in the foreground. In the middle ground, a distinct strip of brown, tilled soil runs horizontally across the field, contrasting with the surrounding green crops. The background shows a flat horizon under a blue sky with light clouds.

“When You Are Transitioning
(No-till & Cover Crops) You
Have The Worst Of Both Worlds.
No Benefits Anymore from the Tillage.
No Benefits Yet from the No-till.”
Dana Fletcher – Courtenay, ND.

Fletcher Farms
Courtenay, North Dakota.



Fletcher Farms - Yield Impacts of Cover Crops Over Time



Menoken Farm – July 2019
60" Corn & Covers



Soil Organic Matter and Available Water Capacity Inches of Water/One Foot of Soil

Percent SOM	Sand	Silt Loam	Silty Clay Loam
1	1.0	1.9	1.4
2	1.4	2.4	1.8
3	1.7	2.9	2.2
4	2.1	3.5	2.6
5	2.5	4.0	3.0

Berman Hudson

Journal Soil and Water Conservation 49(2) 189-194

March – April 1994

Summarized by:

Dr. Mark Liebig, ARS, Mandan, ND

Hal Weiser, Soil Scientist, NRCS, Bismarck, ND

