

A photograph of a field with corn and sunflowers. A sign on the left reads "Aug. 14, 2008" and "1". The text "Southwest ND Soil Health Demonstration" is overlaid on the right side of the image.

Southwest ND Soil Health Demonstration

Toby Stroh

Southwest ND SOIL HEALTH DEMONSTRATION

www.swndsoilhealth.mandakzerotill.org



Dunn County S
Central Stark C
Western D

NDSU
Dickinson Research
Extension Center

Objectives:

- A. How is Soil Health effected by:
 - no tillage
 - a diverse crop rotation
with cover crops
- B. Enhance awareness of Soil Health

Killdeer

11 miles South
Of Killdeer

Hwy 22

15th St. West

Southwest ND		
SOIL HEALTH DEMONSTRATION		
www.swndsoilhealth.mandakzerotill.org		
 NRCS	 SCD's DUNN COUNTY CENTRAL STARK WESTERN	 NDSU Dickinson Research Extension Center

**DREC Ranch
Headquarters**

Hwy 22

Dickinson

22 miles North
of Dickinson

SW ND Soil Health Demonstration

District: CENTRAL STARK SOIL CONSERVATION DISTRICT
WESTERN SOIL CONSERVATION DISTRICT
DUNN COUNTY SOIL CONSERVATION DISTRICT

Field Office: DICKINSON SERVICE CENTER
Agency: Natural Resources Conservation Service
Assisted By: Krance, Shawn
State and County: ND, STARK
Date: 2/8/2010

Approximate Acres: 133



NE 1/4 Sec. 24
T143N R96 W

Dunn County, ND
8 Fields
Approx. 12 – 18 ac.

Diverse Crop Rotation

Alfalfa

Alfalfa

Alfalfa

Winter Triticale / Hairy Vetch 7 - 10 Cover Crop

Corn

Oats/Peas 7 - 10 Cover Crop

Spring Wheat

Winter Wheat

2012 Cover Crop Mix

	<u>lb/ac</u>
Millet	5
Sorghum	7
Sunflower	.6
Safflower	4.5
Hunter Brassica	.5
Graza Brassica	1.5
Soybeans	<u>4.5</u>
Total	23.6 lb/ac

2008 Alfalfa
2009 Alfalfa
2010 Alfalfa-Winter Triticale/Hairy Vetch
2011 Winter Triticale/Hairy Vetch
2012 Corn

Fld 8
17.8 ac.

2008 10-way Cover Crop
2009 Alfalfa
2010 Alfalfa
2011 Alf- Wntr Triticl./ Hairy Vetch
2012 Spring Triticale/Hairy Vetch

Fld 1
17.5 ac.

2008 Alfalfa
2009 Alfalfa- Winter Triticale/Hairy Vetch
2010 Winter Triticale/Hairy Vetch
2011 Corn
2012 Oats and Peas - Cover Crop

Fld 7
17.8 ac.

2008 Spring Wheat
2009 Winter Wheat
2010 Alfalfa
2011 Alfalfa
2012 Alf.- Wntr Triticale/Hairy Vetch

Fld 2
17.5 ac.

2008 Spring wheat-Wntr Triticale/Hairy Vetch
2009 Wntr Triticale/Hairy Vetch - Cover Crop
2010 Corn
2011 Oats \ Peas - Cover Crop
2012 Spring Wheat

Fld 6
12.7 ac.

Fld 3
13.8 ac.

2008 Peas- Cover Crop
2009 Spring Wheat
2010 Winter Wheat-Alfalfa
2011 Alfalfa
2012 Alfalfa

2008 Oats- Cover Crop
2009 Corn
2010 Oats and Peas- Cover Crop
2011 Spring Wheat
2012 Winter Wheat - Sanfoin

Fld 5
18.1 ac.

Fld 4
17.8 ac.

2008 Corn-Graze-Cover Crop
2009 Oats\Peas- Cover Crop
2010 Spring Wheat
2011 Winter Wheat-Alfalfa
2012 Alfalfa



Used JD 1590 drill

2008 Plot 1
Poor cover
Poor structure
Poor infiltration



2008 Plot 1
Poor cover
Poor structure
Poor infiltration



2012 Plot 8

cover with triticale residue
similar rain event to 2008

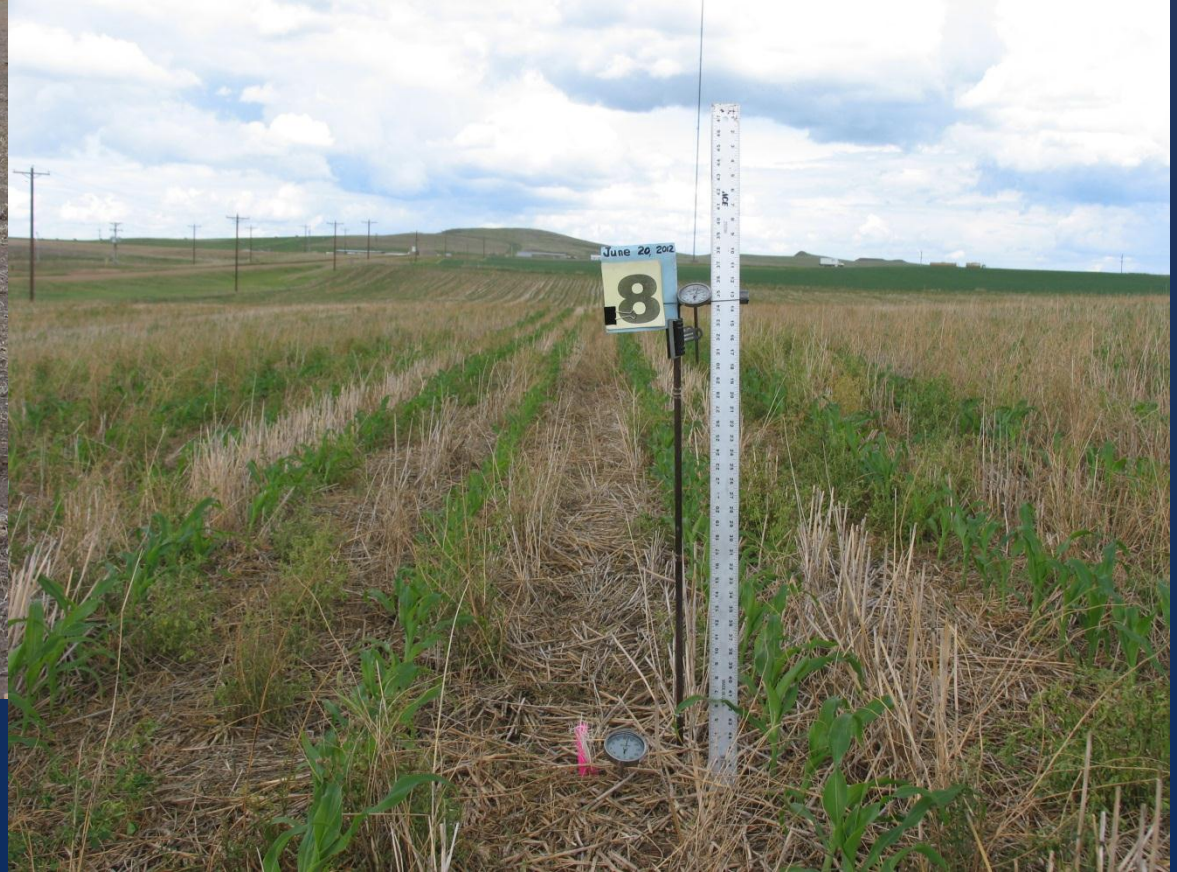


2008 Plot 1
Poor cover
Poor structure
Poor infiltration





2008



2012 Corn planted
in triticale residue

Residue after corn



2008

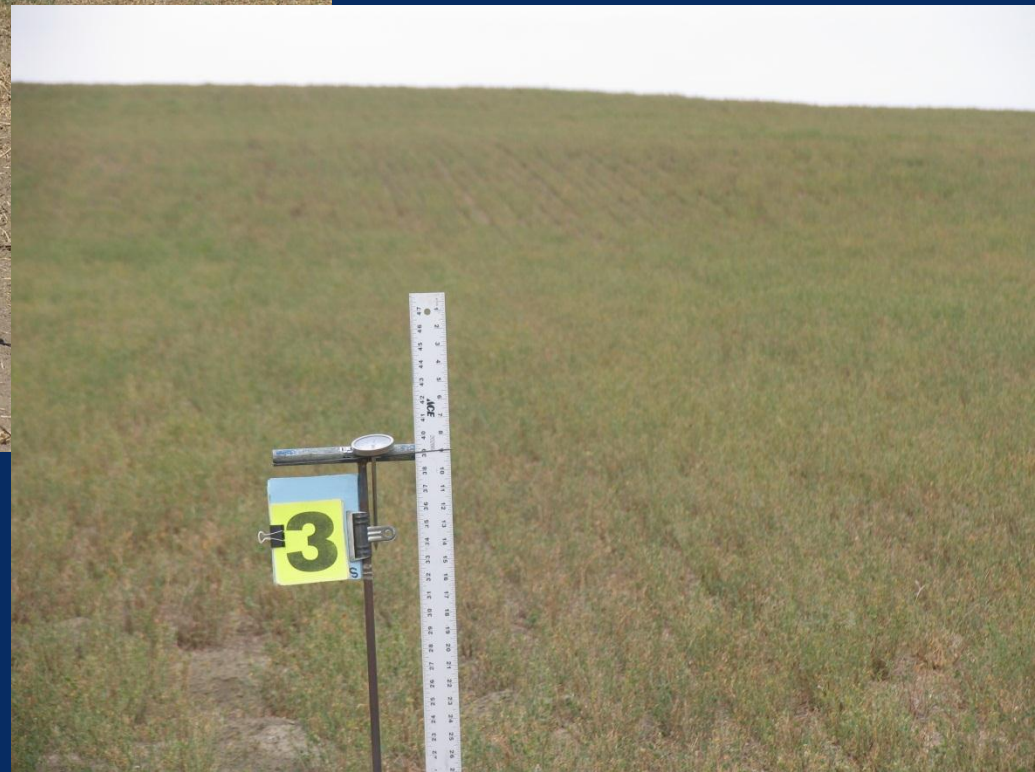


2012





2008
No cover
cover crop attempted
after Pea/Oat



2012
Second year alfalfa

Winter wheat residue

Sanfoin seeded 8-21-12





**2008 Field 1
plow pan
poor aggregation**



2012 Field 1
after 1 year 10 way cover crop and
3 years of alfalfa
more improvement needed





2009 Plot 8 Alfalfa - poor stand in 2008



**2012 Field 1
Spring Triticale**



July 29, 2009 Plot 5
2008 oats (hayed) cover crop - poor

Cover crops



Oct. 2008
after oat/pea



Sept. 2009
after winter triticale

Cover crops



Sept. 2012
after oat/pea

Seeded 7-20-12



Sept. 2012
after winter triticale
DREC 6 miles west of demo.
Seeded 6-30-12

Cover crops

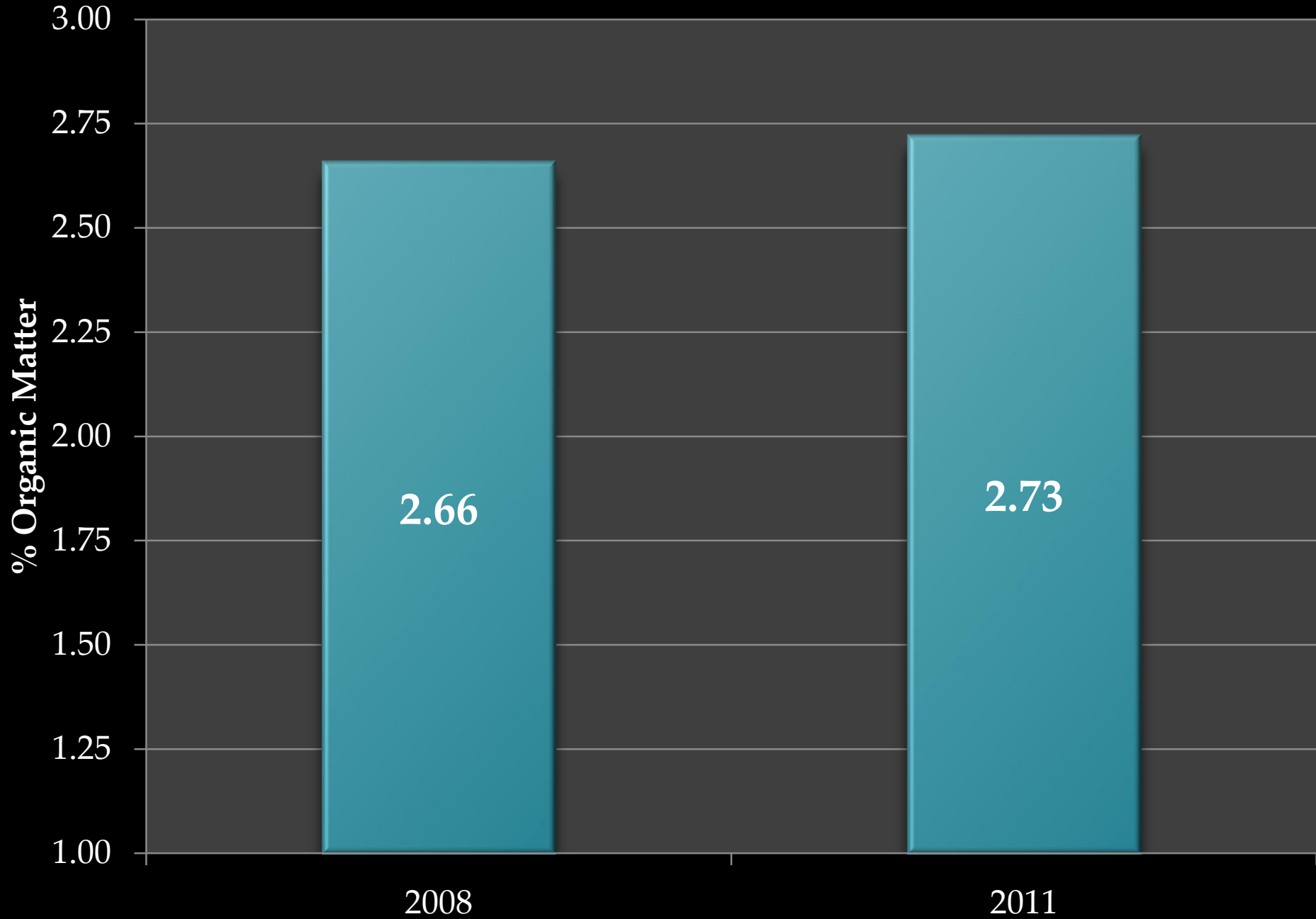


**Nov. 8, 2012
after oat/pea**

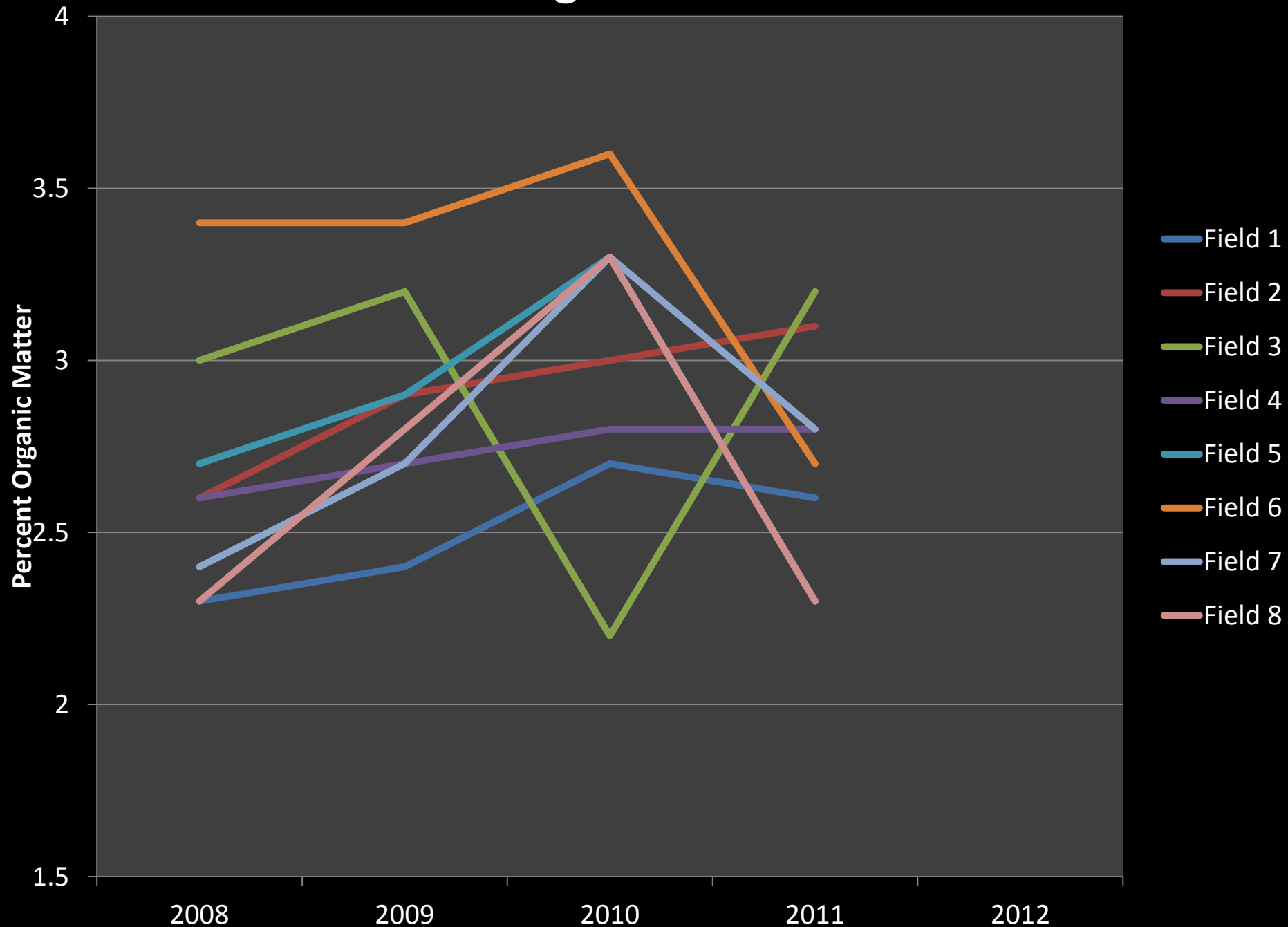


**Nov. 8 2012
after winter triticale
DREC 6 miles west of demo.**

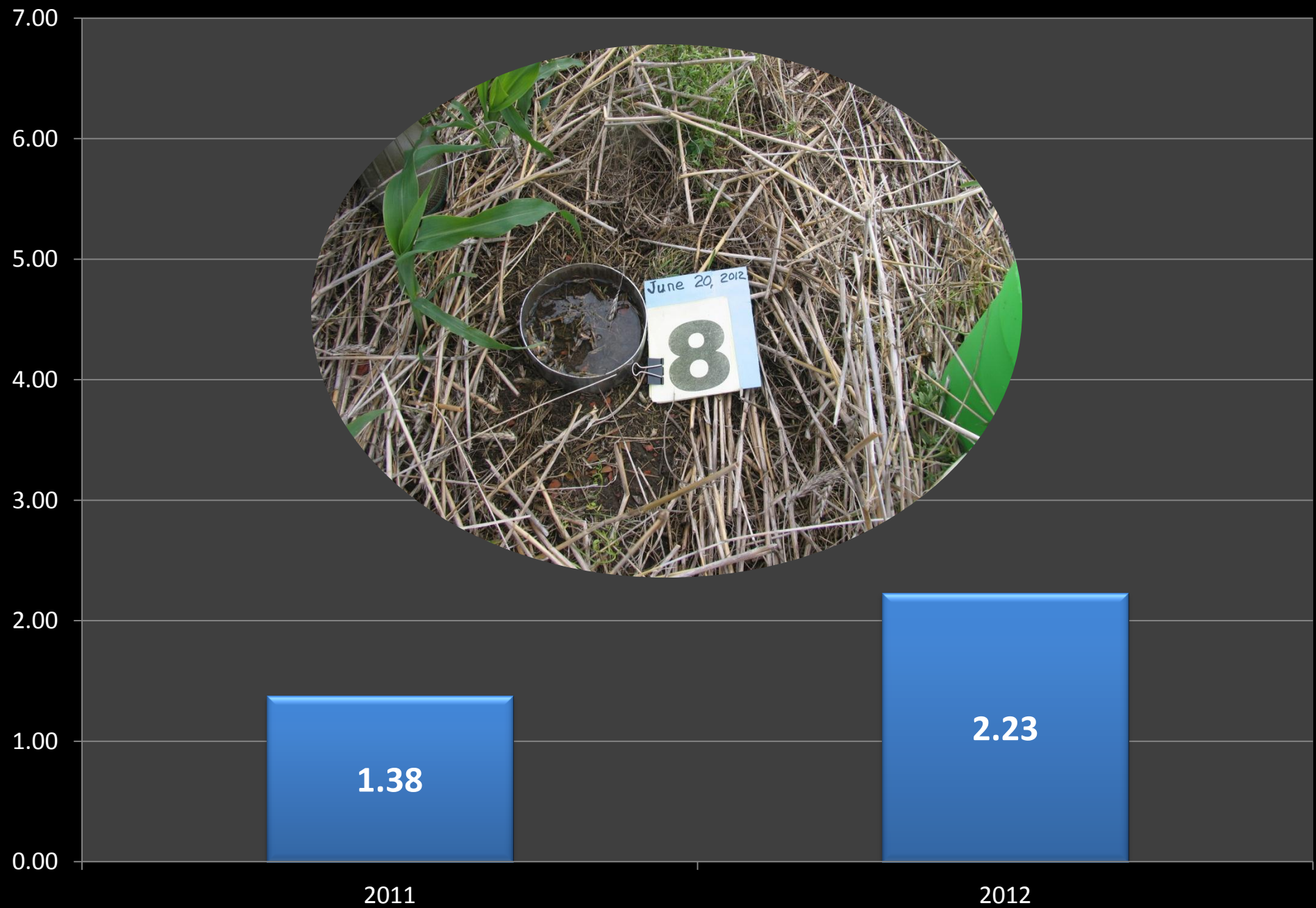
Average Organic Matter...But...



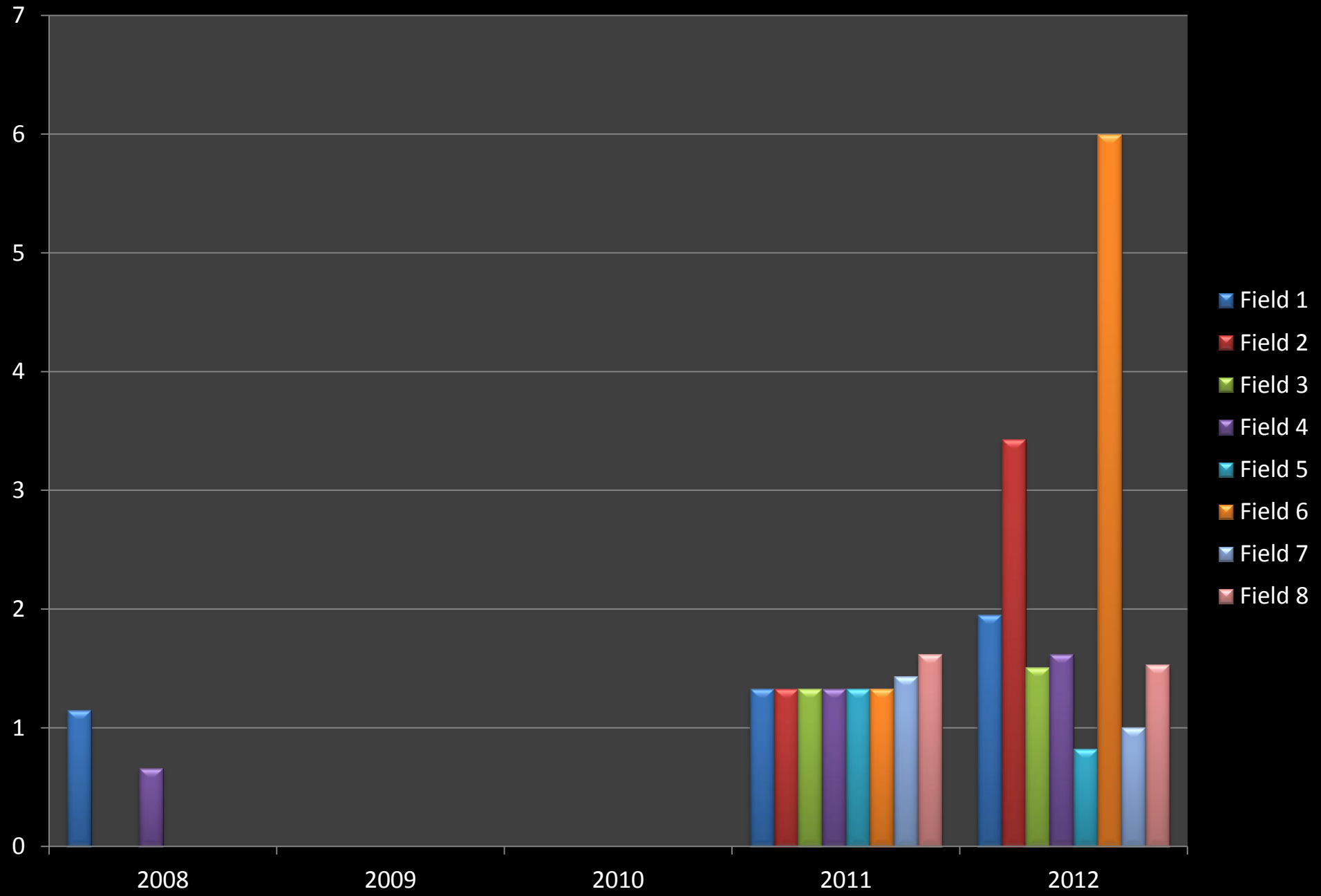
Organic Matter



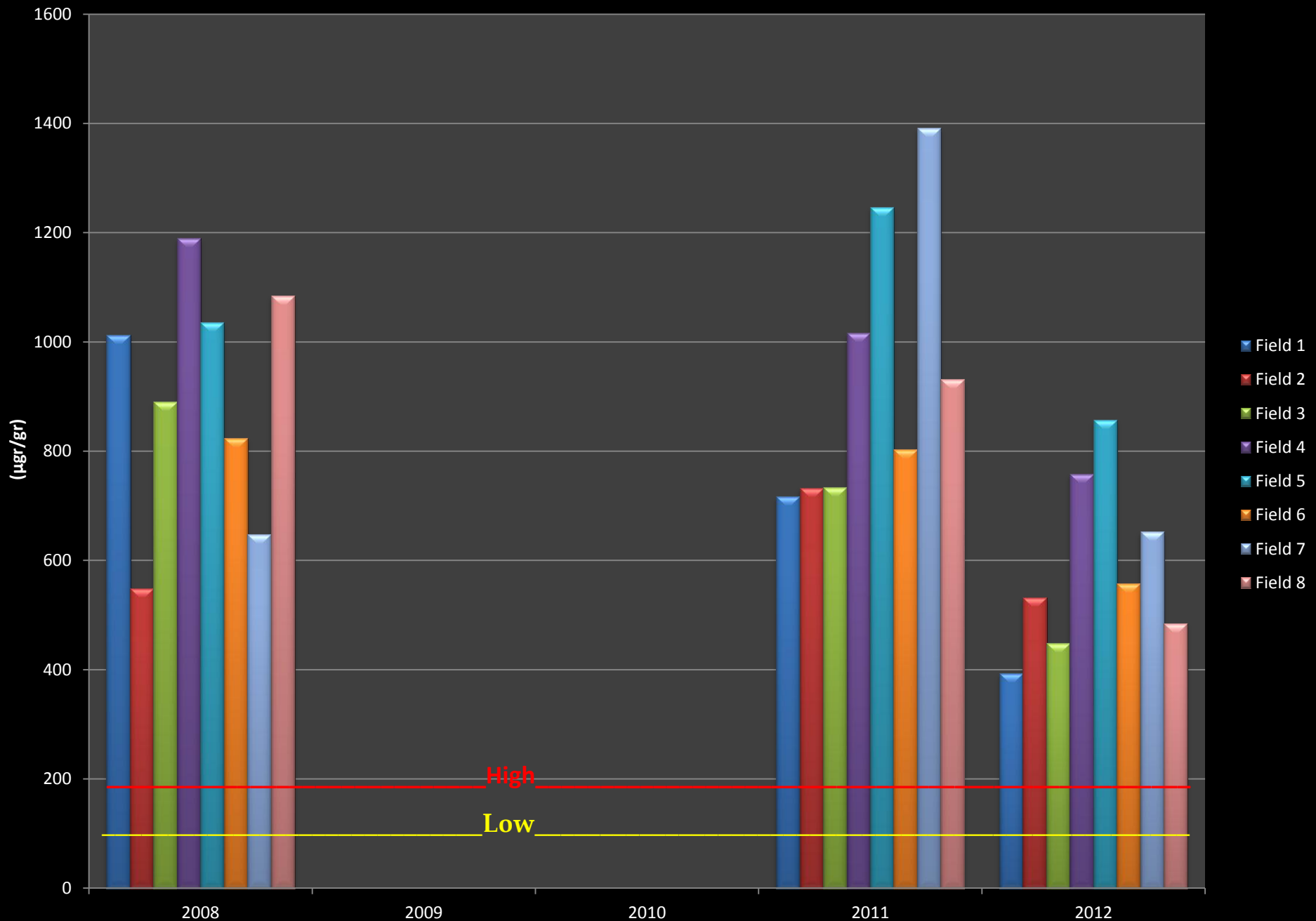
Average Water Infiltration (in/hr)



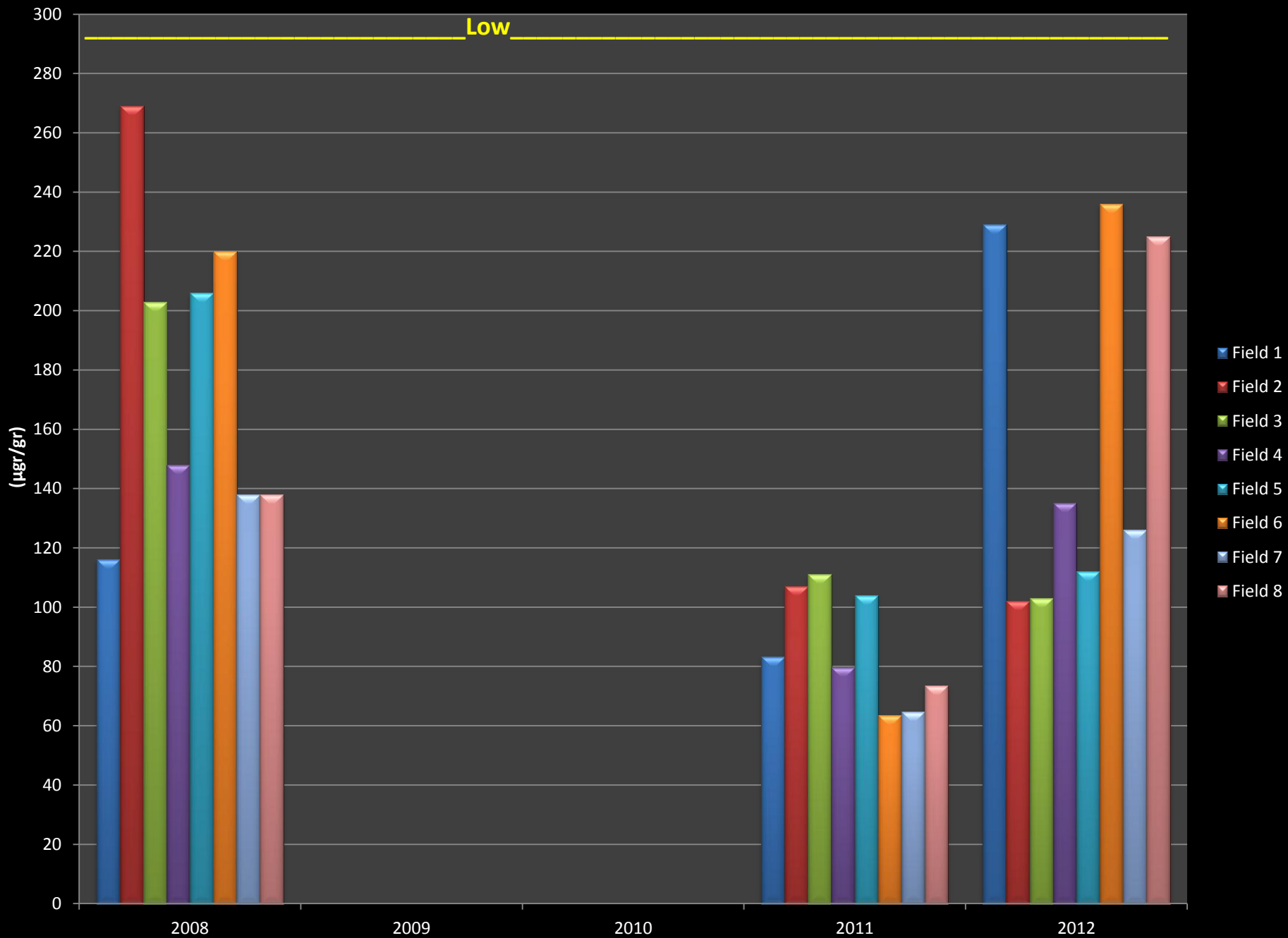
Water Infiltration (in/hr)



Total Bacteria



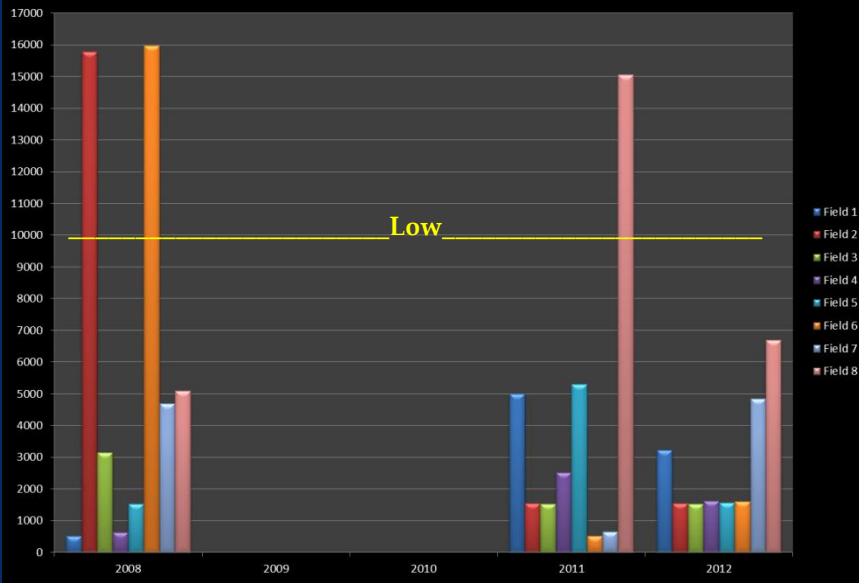
Total Fungal



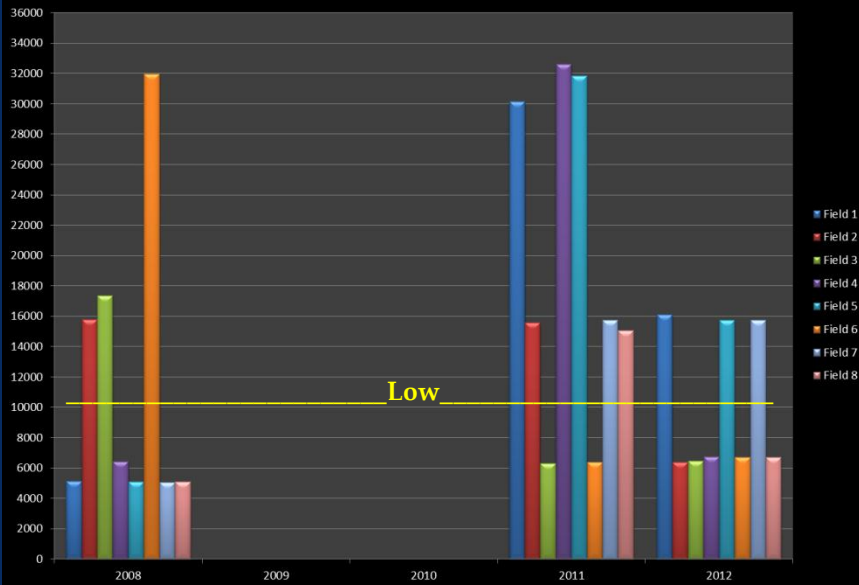
Protozoa

(numbers/g)

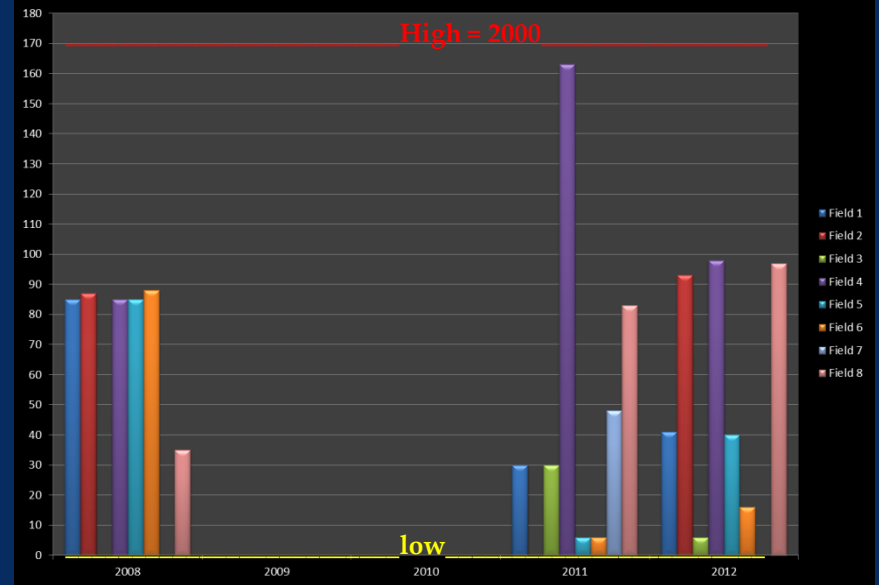
Flagellate Protozoa



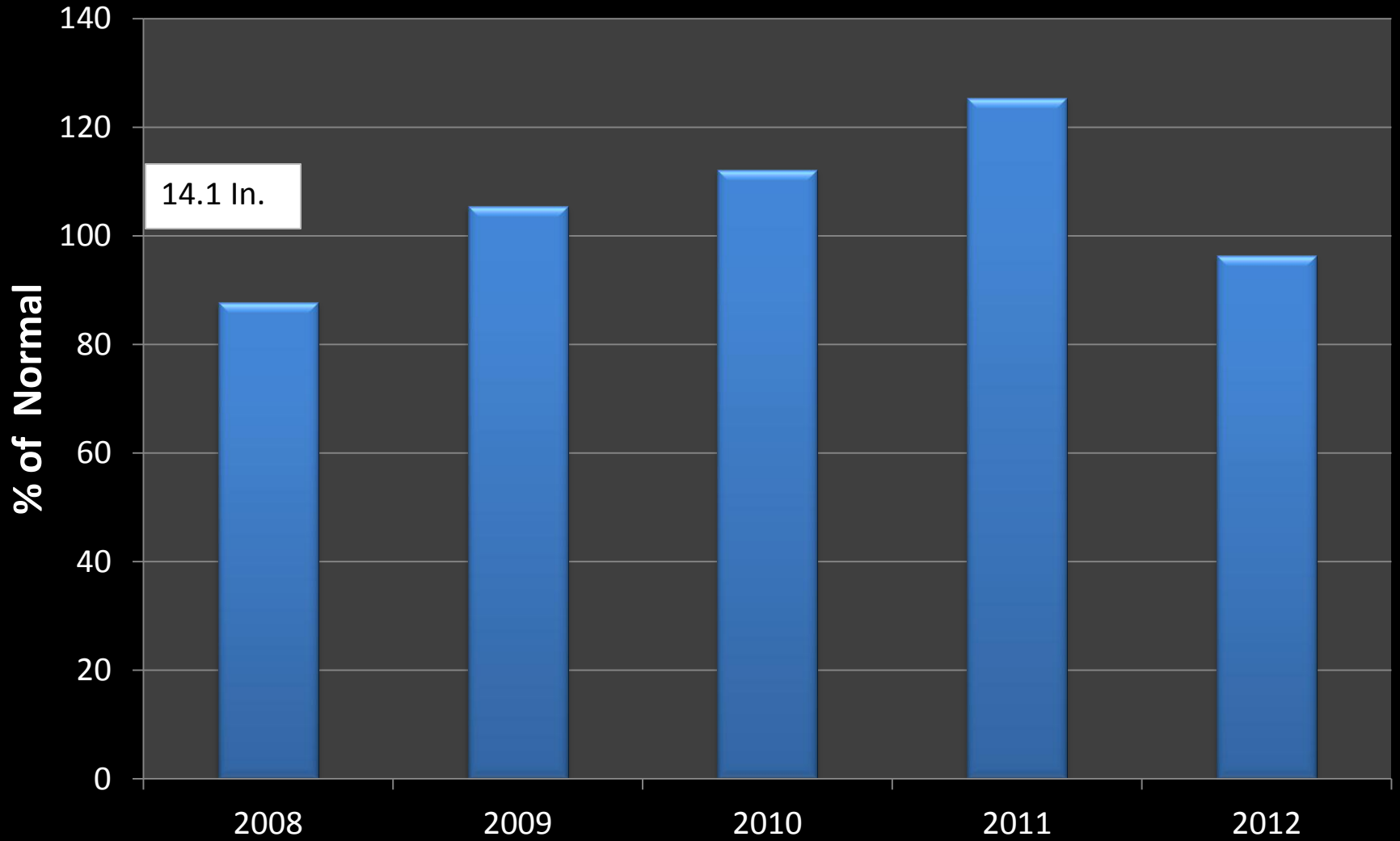
Amoebate Protozoa



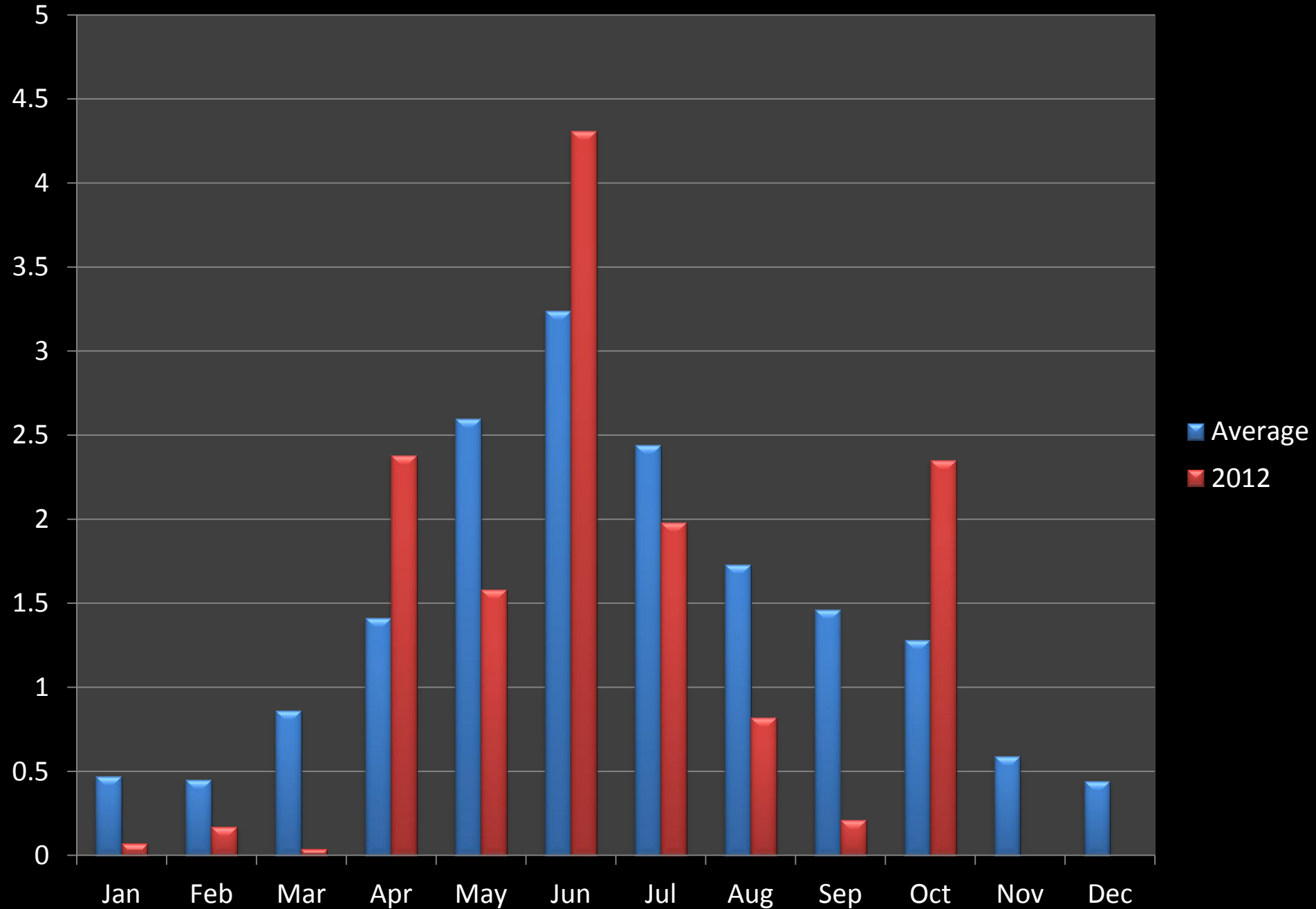
Ciliate Protozoa



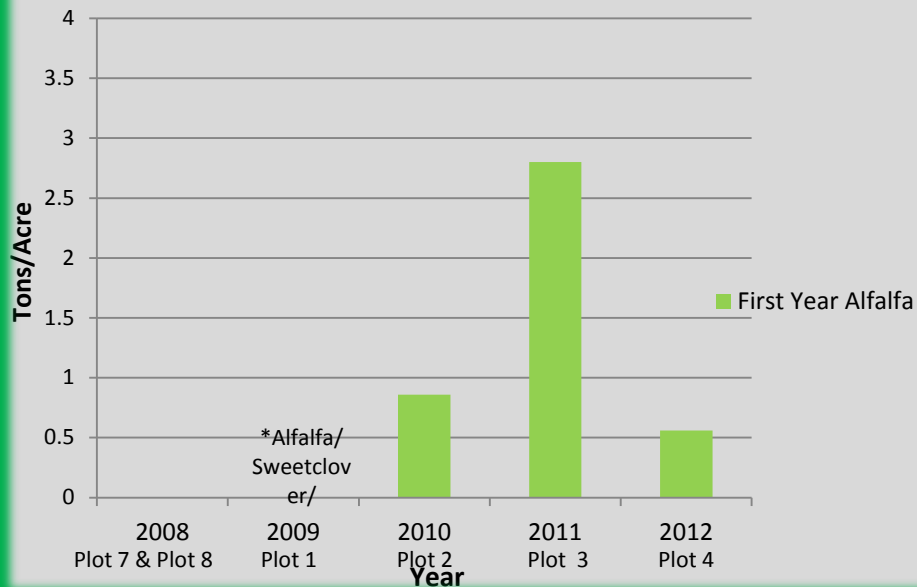
Percipitation at DREC Manning Ranch April - Oct.



Long-term Mean Monthly Precipitation (In.)



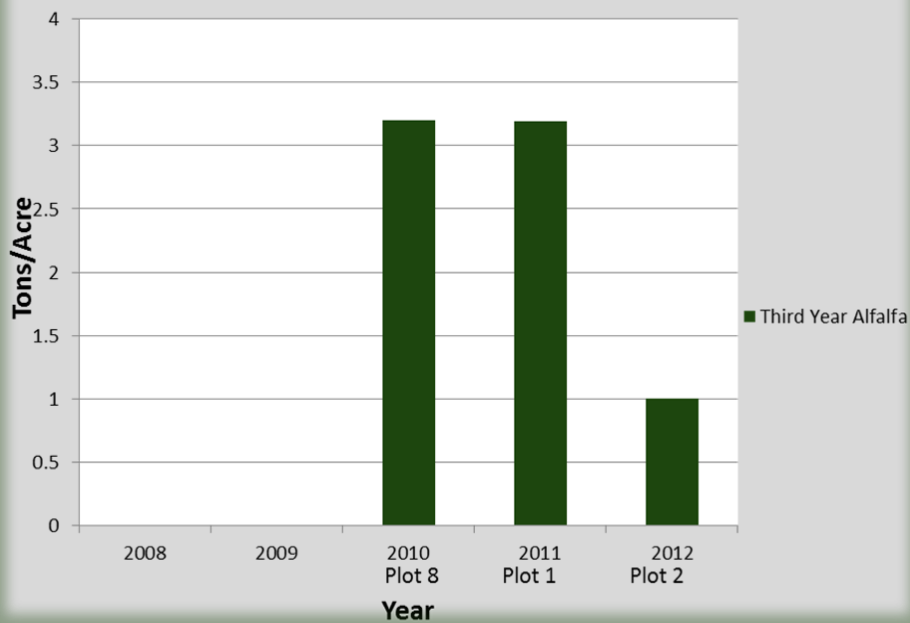
First Year Alfalfa



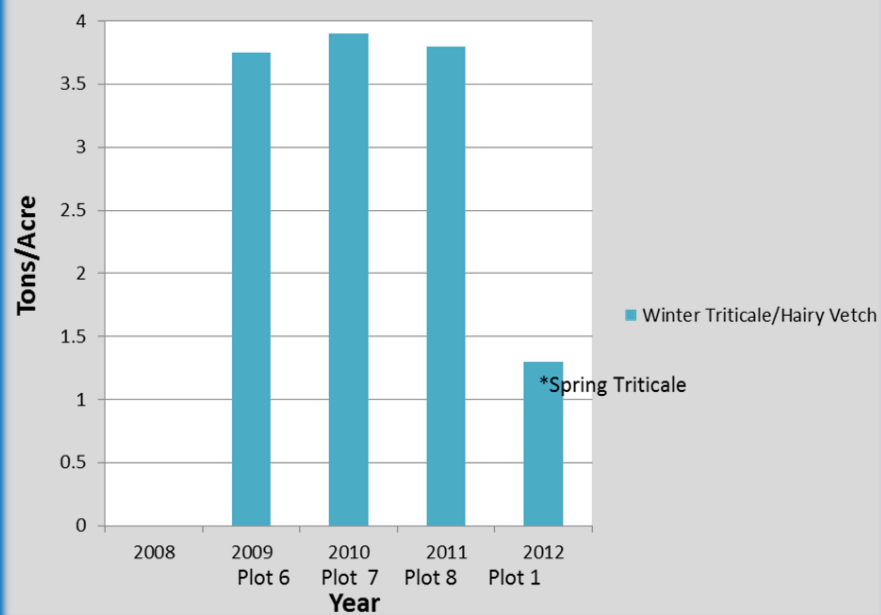
Second Year Alfalfa



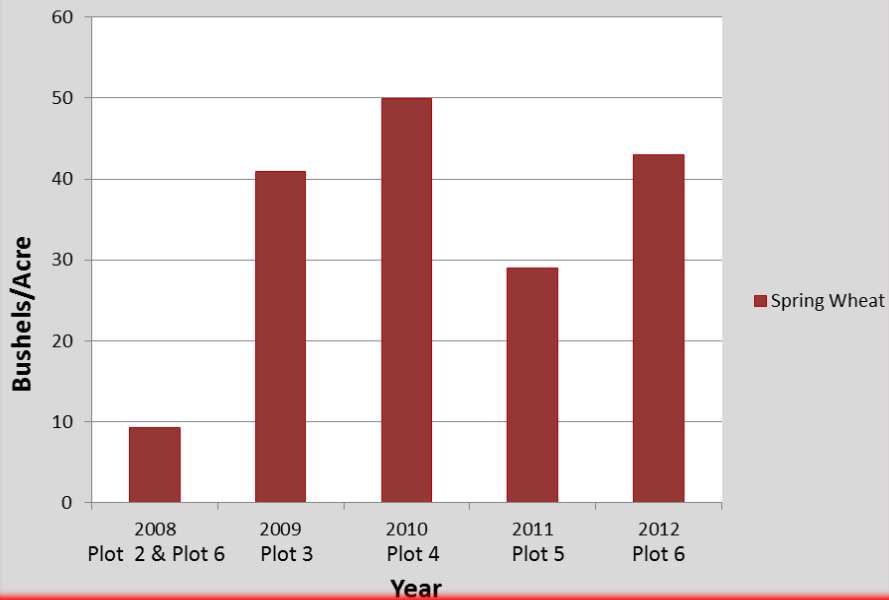
Third Year Alfalfa



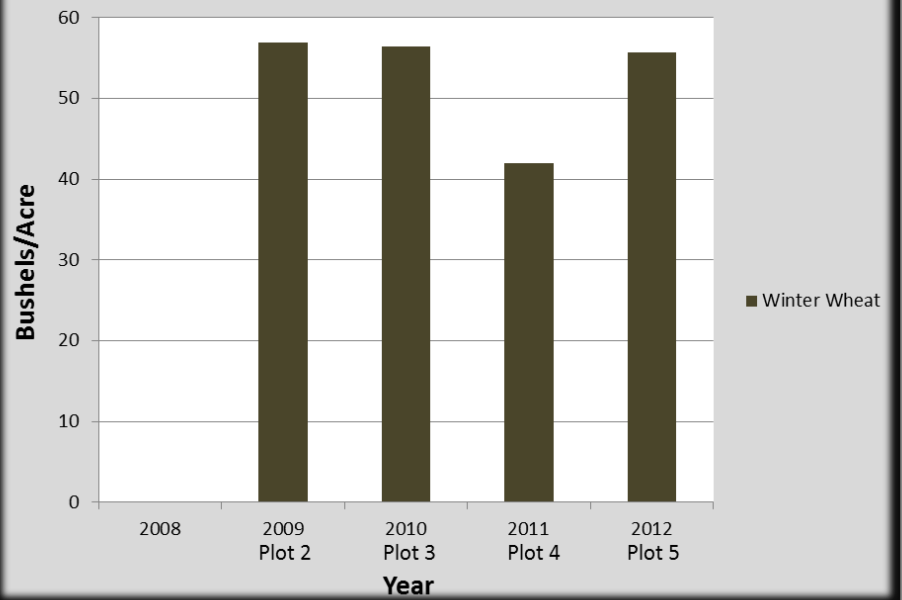
Winter Triticale/Hairy Vetch



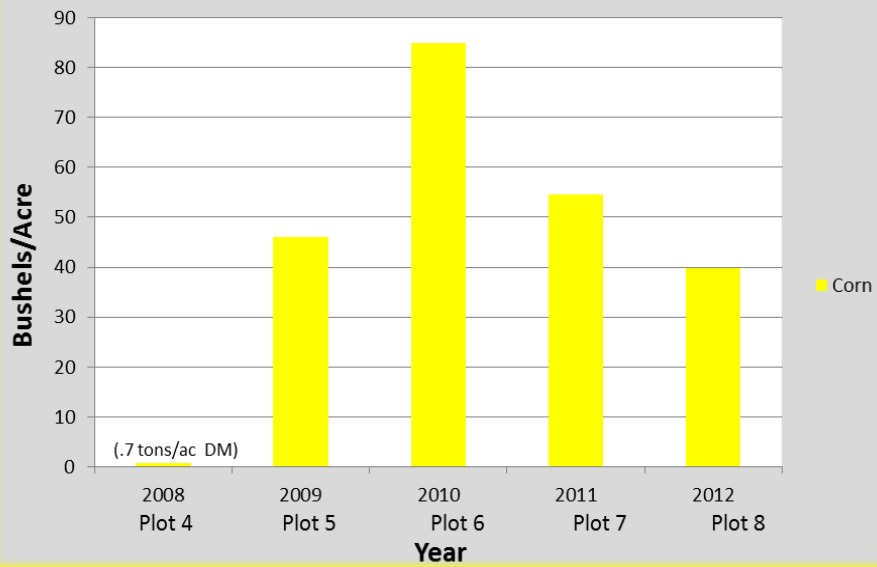
Spring Wheat



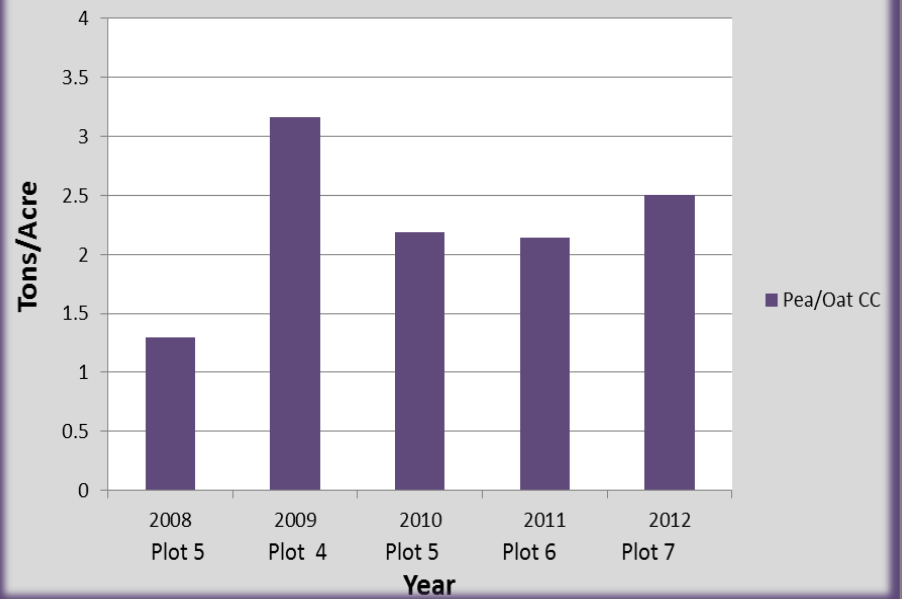
Winter Wheat



Corn




Pea/Oat CC

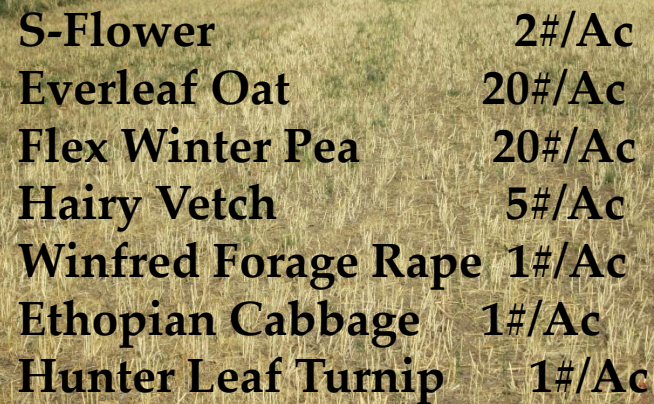


Thoughts:

- Demonstration was successful
- Armor Up....cover, cover, cover – 1st thing
- Seeding cover crop after winter annual harvested or grazed in June
- Results are variable – research would help



Winter Triticale-Hairy Vetch



S-Flower	2#/Ac
Everleaf Oat	20#/Ac
Flex Winter Pea	20#/Ac
Hairy Vetch	5#/Ac
Winfred Forage Rape	1#/Ac
Ethiopian Cabbage	1#/Ac
Hunter Leaf Turnip	1#/Ac

07/13/2012



September 18

09/13/2012



October 17

10/17/2012