



NDSU

DICKINSON
RESEARCH EXTENSION CENTER

CHAPTER 4

Soil: A Source of Life -- Our Responsibility: Protect It!

Songul Senturklu, PhD, visiting scholar, Turkey
Douglas Landblom, Animal Scientist, DREC

Continuing Our Commitment Of Service To Agriculture Since 1905
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Soil: A Source of Life

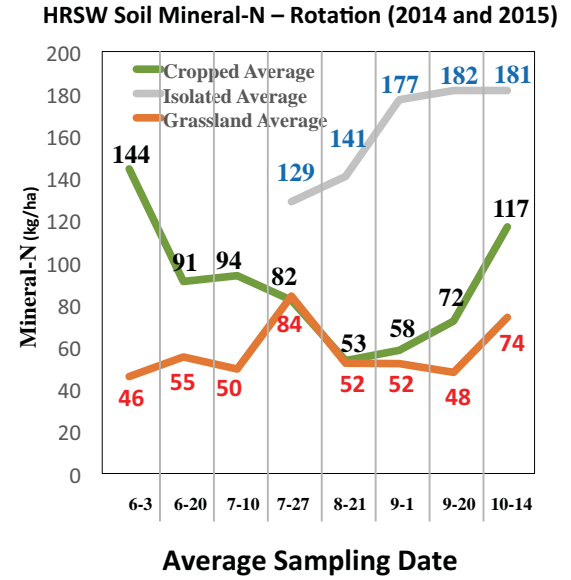
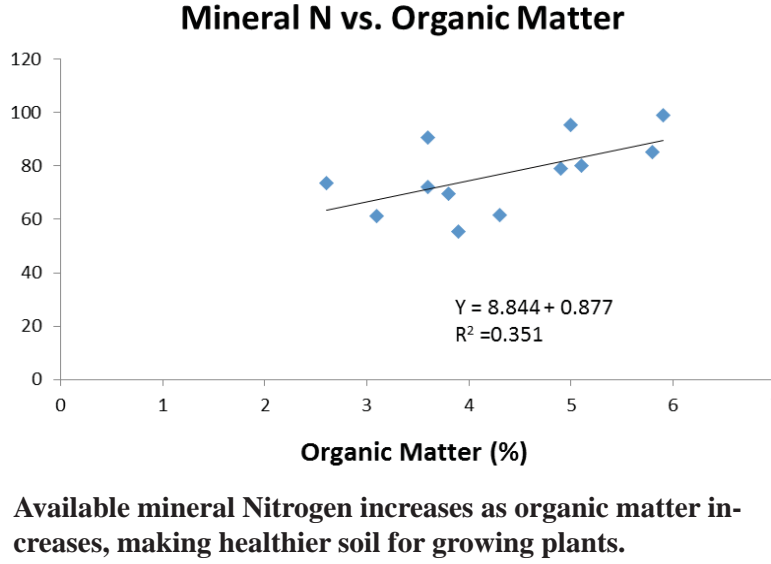
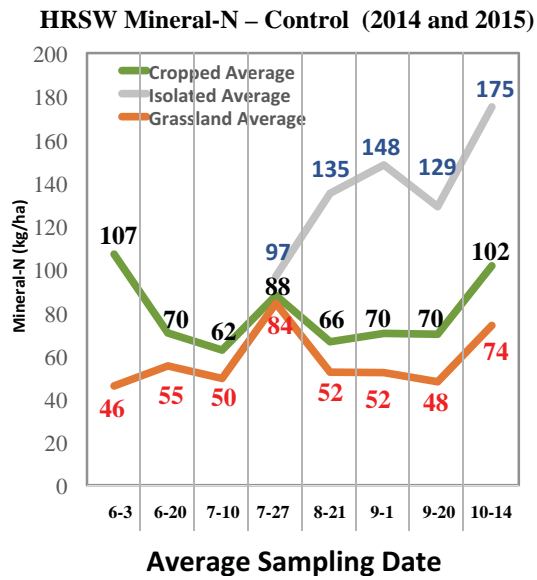
Our Responsibility: Protect It!

- Prevent Erosion**
- Minimal soil disturbance**
- Increase soil organic matter**
- Keep a living root in the soil**
- Increase plant diversity**
- Integrate livestock**
- Increase soil nutrient cycling**
- Reduce fertilizer input**
- Forage for haying and/or grazing**

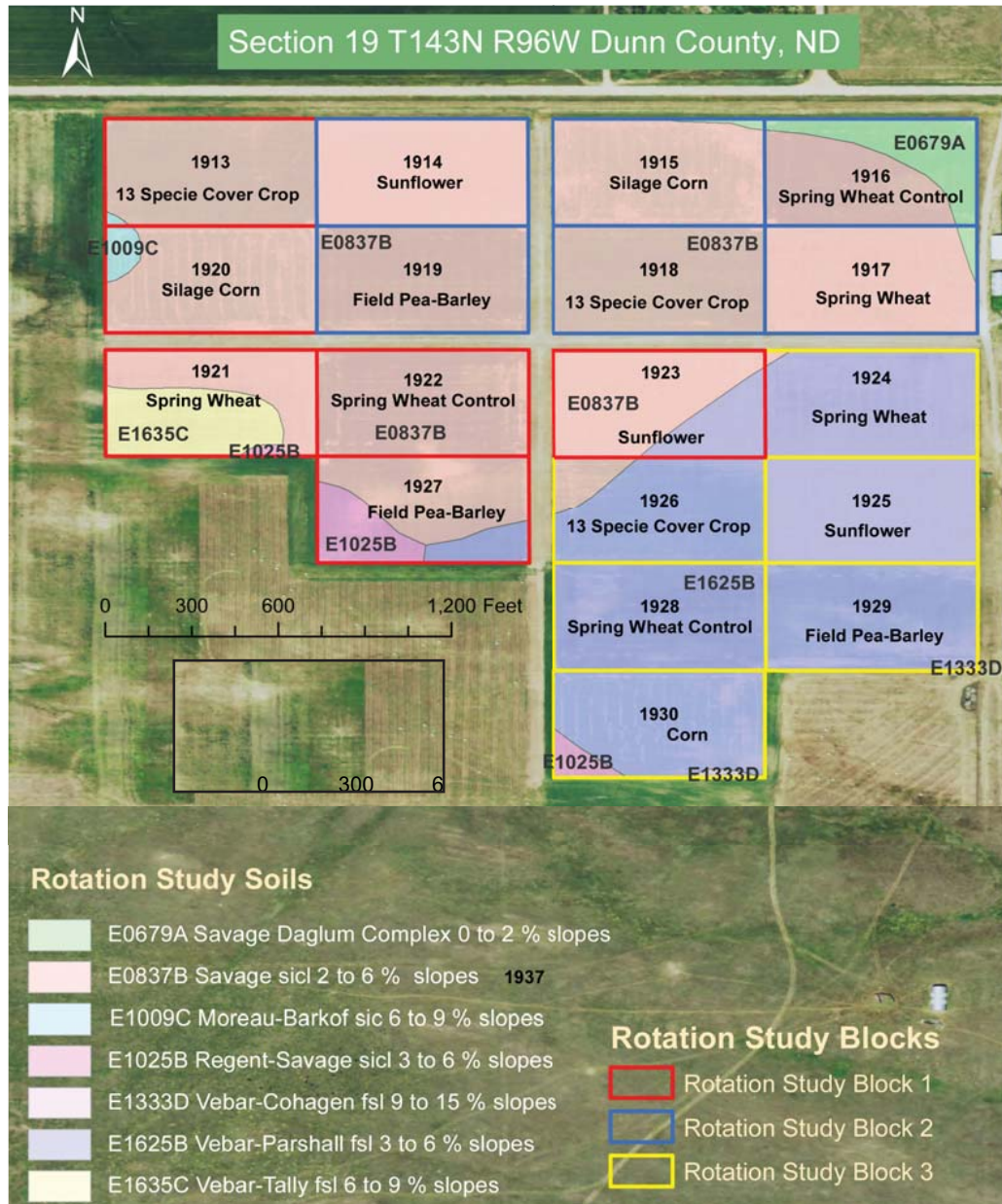
Dr. Songul Senturklu and Douglas Landblom
Cow Efficiency Congress, September 2, 2017



Are You Working For the Soil?
OR
 Is The Soil Working For You?



Cropland Production Systems



Map of diverse crop rotation + livestock grazing study (inset cover crop emerging August 2017). Graphic by Jon Stika.

Diversity Through Rotational System Enhances Revenue

PRACTICES

- No-Till Seeding and Planting
- Maintaining a Living Root
- Keeping Soil Covered

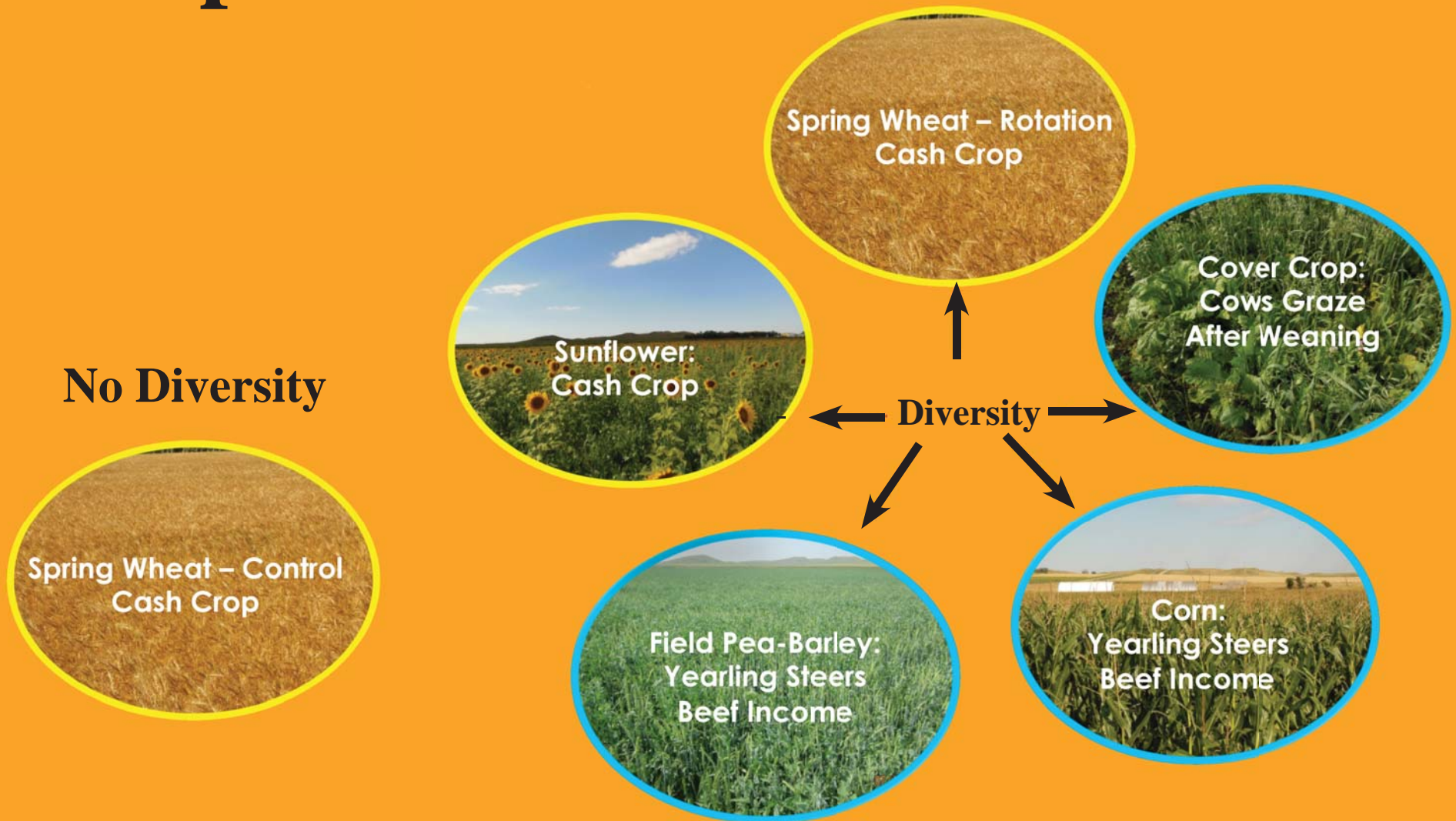
DIVERSE ROTATION

- Hard Red Spring Wheat
- Winter Triticale/Hairy Vetch
- 7-specie Cover Crop
- Corn Silage
- Corn Grain
- Pea-Barley
- Sunflower

OUTCOMES

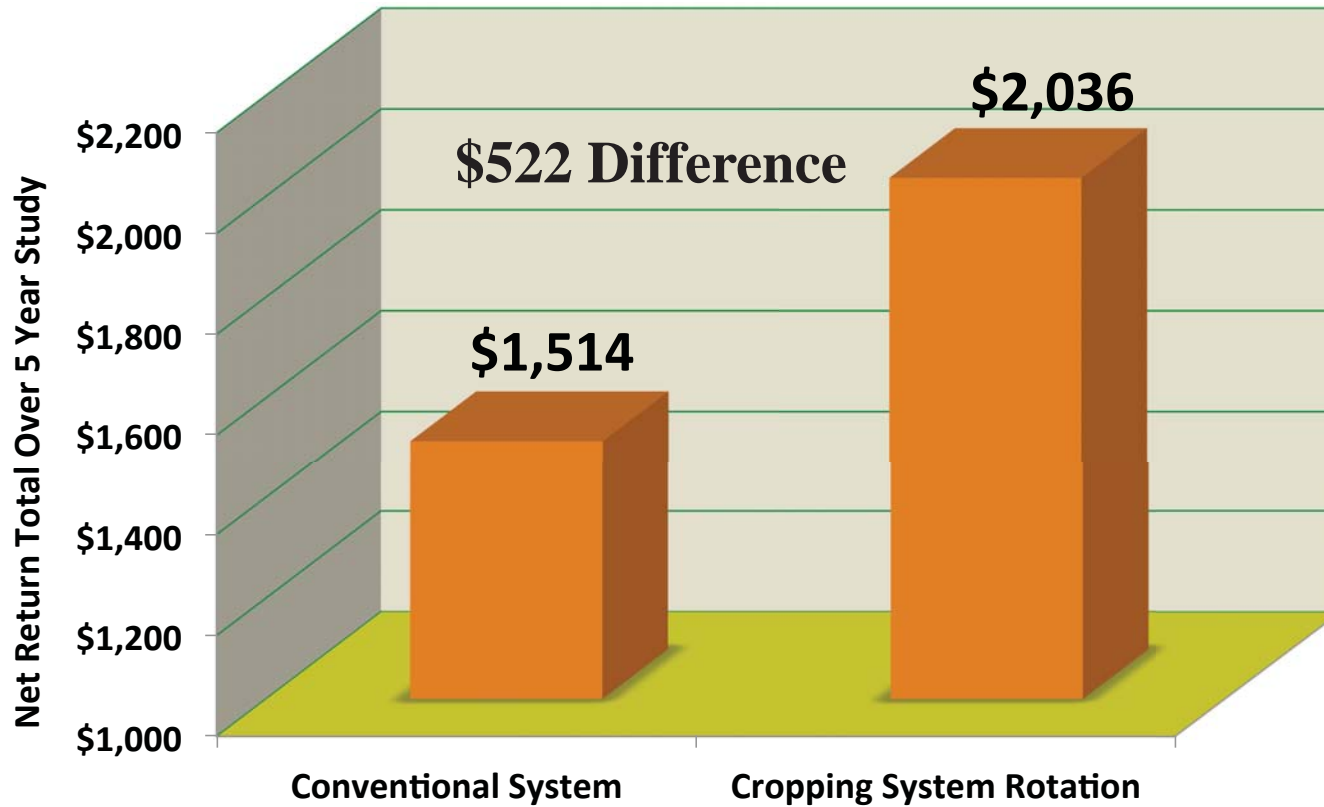
- Enhance Mineral Nitrogen
- Reduce or Eliminate Fertilizer
- Weed/Pest/Disease Control
- Improve Forage Production
- Integrate Livestock Usage
- Revenue Stream Enhancement

Crop Rotation

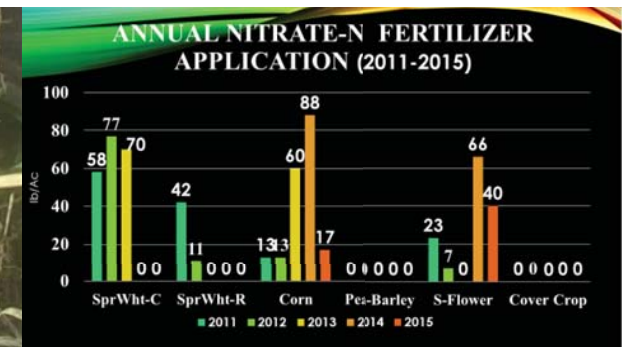


Rotation Shows Revenue Opportunity

System Net Return, \$

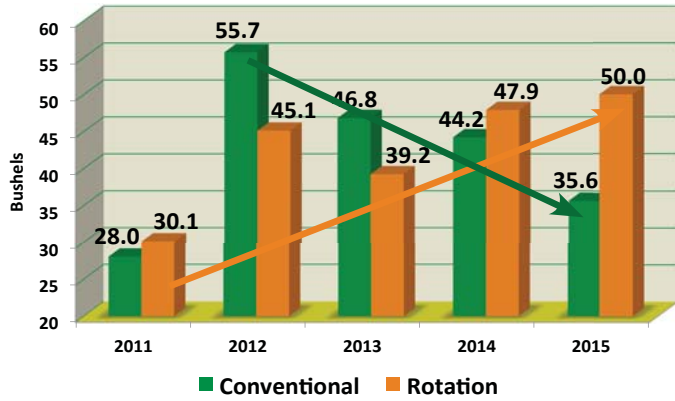


**34% Increase
In Revenue
Stream By
Using Crop
Rotation
System**

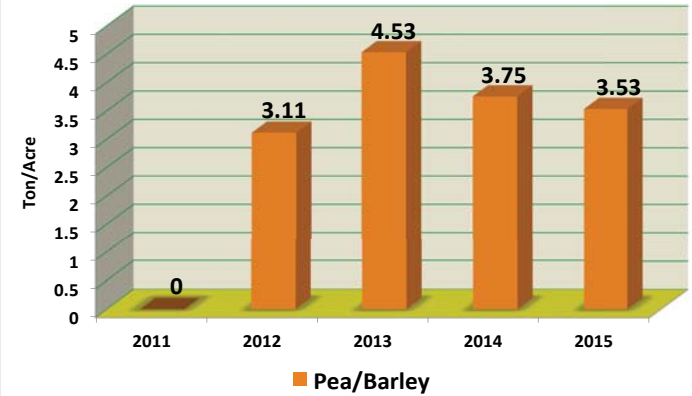


Production Results Of Crops In Rotation

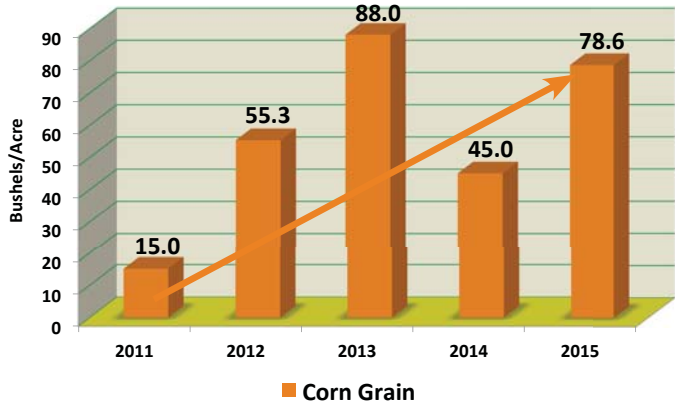
Hard Red Spring Wheat Yields



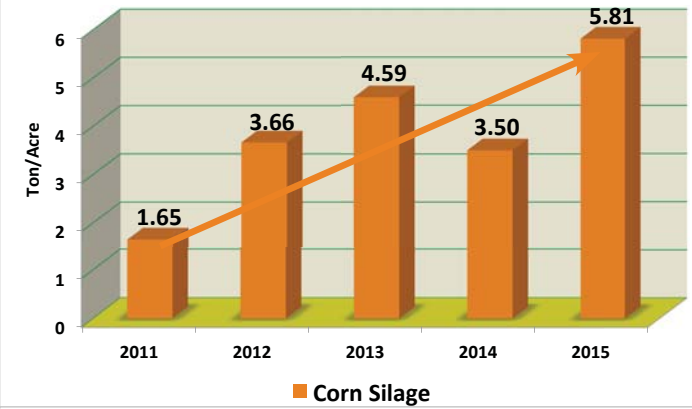
Pea/Barley Yields



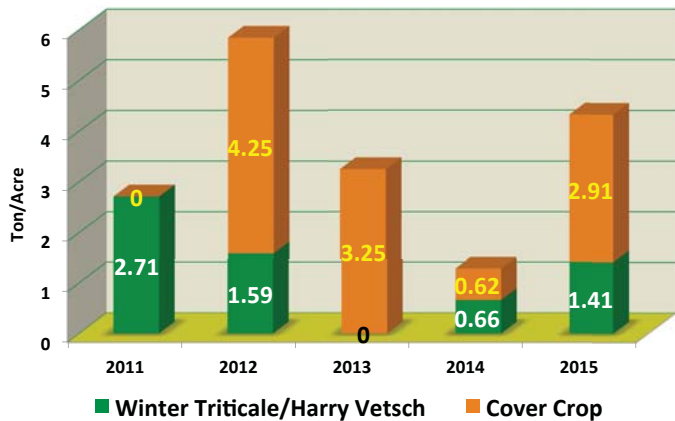
Corn Grain Yields



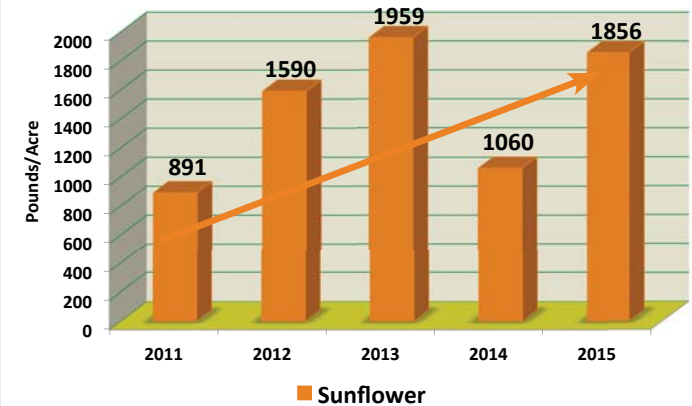
Corn Silage Yields



Winter Triticale/Hairy Vetsch and Cover Crop Yields



Sunflower Yields

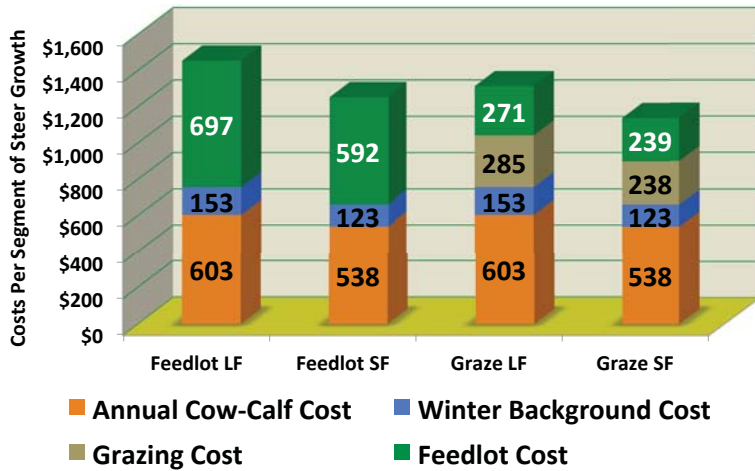


Beef: Added Diversity for Soil Use

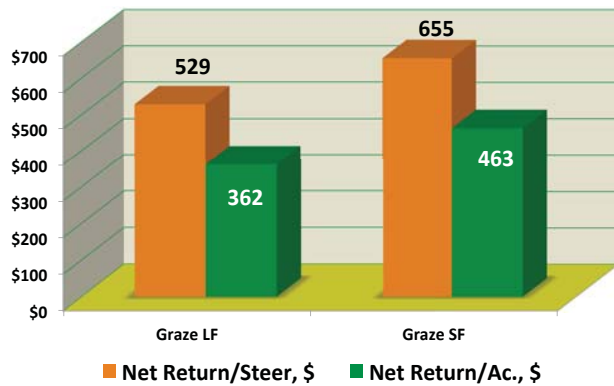


Researching conventional and non-conventional grazing management methods for large and small frame yearlings.

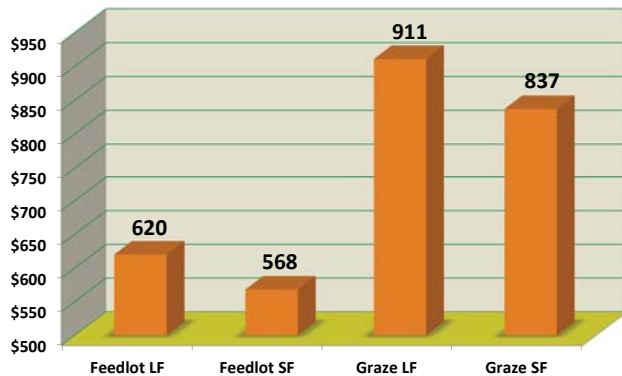
Steer Costs: Feedlot vs. Grazing System



End Grazing Net Returns



System Finishing Net Return/Steer



Grazing system vs. conventional feedlot system

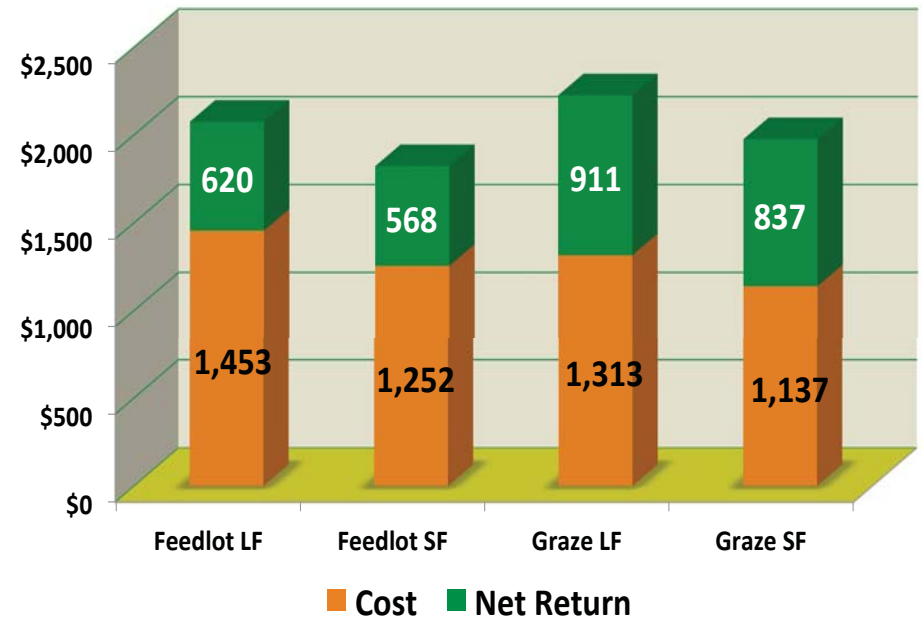
46.9%

increase in revenue stream for large framed steers

47.4%

increase in revenue stream for small framed steers

Carcass Value = **Costs** + **Net Return**



Beef Cattle Wintering Questions:

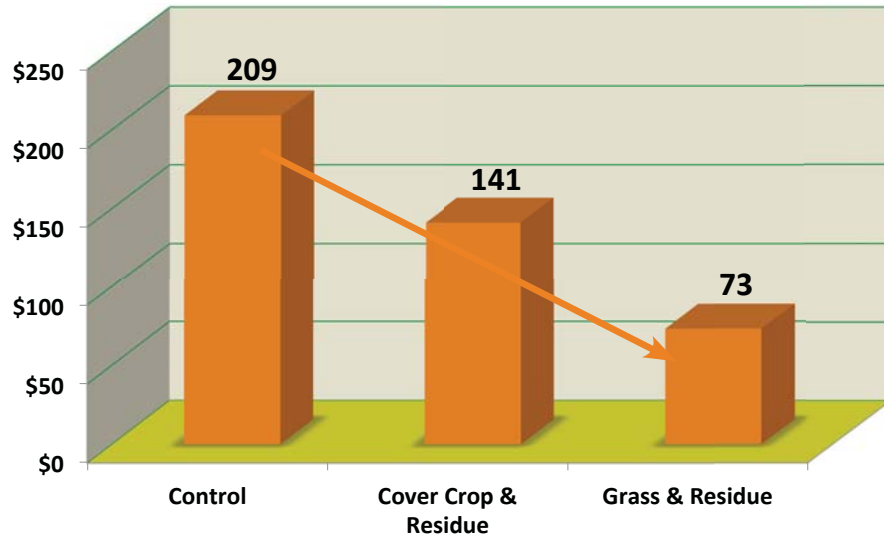
Are Your Cattle Working For You?

OR

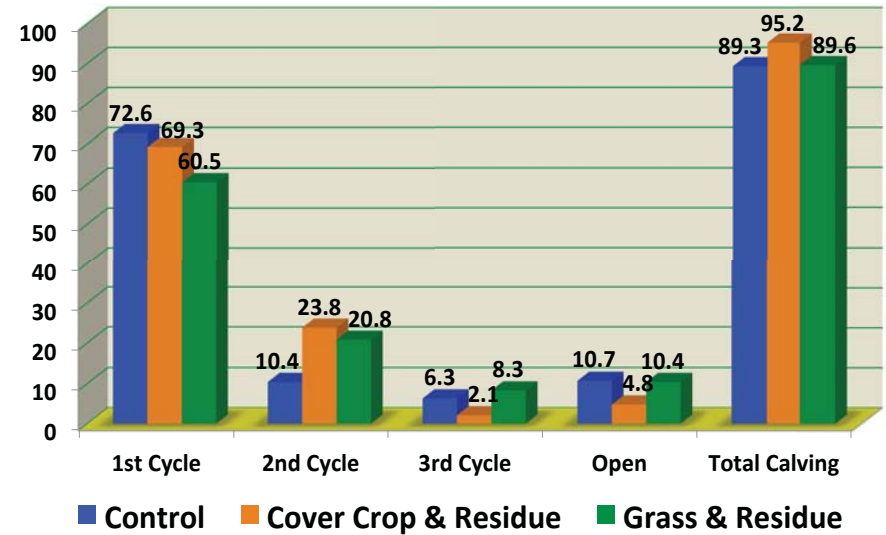
Are You Working For Your Cattle?

Beef Cattle Wintering

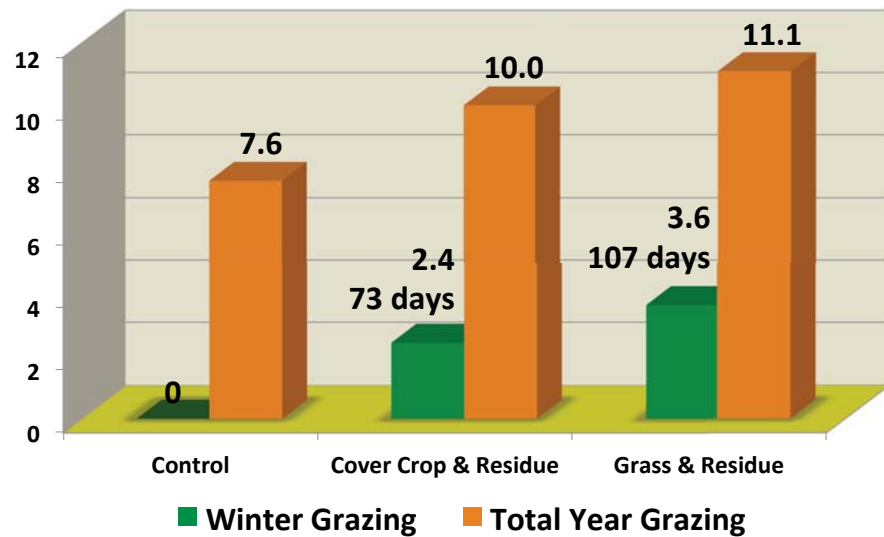
Total Winter Feed Cost Per Cow



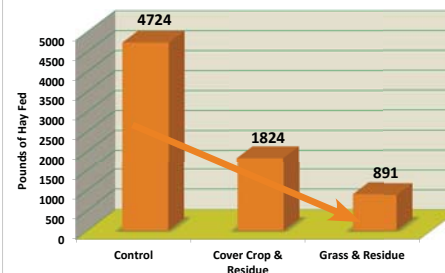
Reproductive Performance



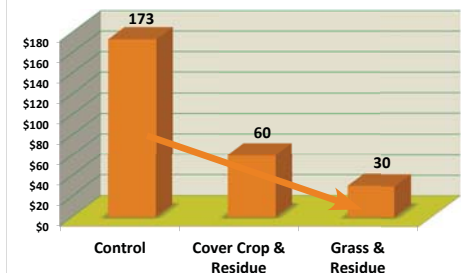
Annual Months Grazing



Winter Hay Fed Per Cow



Hay Cost Per Cow





SARE Cooperator Projects

Cover crops are an important part of the Dukart Ranch operation near Manning, ND.

Derrick and Angie Dukart
Manning, ND

Field Size = 26 acres

Seeding Information

Seeded June 16 at 35 lbs/acre

Mix of Cowpea, Soybean, Mung Bean, Vetch, Red Clover, Pearl & Proso Millet, Sorghum Sudan, Nitro Radish, Winfred Hybrid Turnip, Sunflower and Oats

Cost = \$30.00 per acre; Seeding depth ~ 3/4 inch

Harvest/Field Usage

Dry matter per acre = 2.3 ton/acre

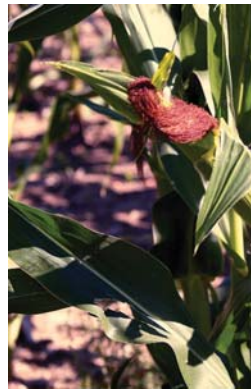
Nov. 26-Dec. 5: 254 coming 3rd trimester cows turned onto field

December 29: 150 head of bred heifers and young cows grazed for 7 day before starting to feed hay and silage. Practice of feeding hay and silage on this piece of ground continues.

Following Year:

Grain corn yield of 128 bushels with 51 pounds of nitrogen left in the profile.

Similar management will continue on a larger scale.



SARE Cooperator Projects



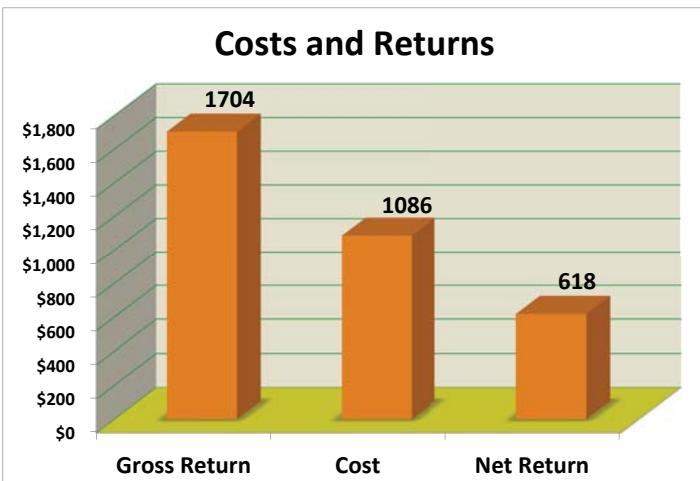
Lucas and Jolene Hoff retooled wintering setup, using weaned calves to harvest corn.

Lucas and Jolene Hoff
Richardton, ND



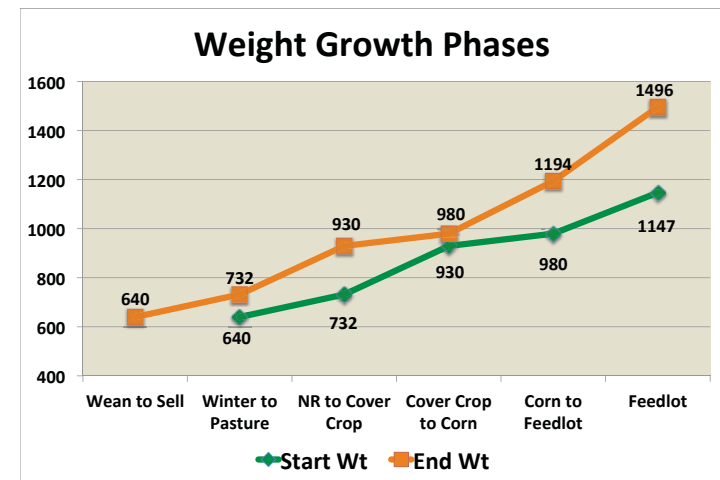
Lucas Hoff

Is it more profitable to harvest corn for grain or have calves harvest corn?



Data from 2012-2015 showed more actual cash profit with cattle grazing corn.

Next step was retained ownership program. Graphs show returns and growth.



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Senturklu S., D. G. Landblom, and S. I. Paisley. 2016. Effect of Rotational Crop, Effect of rotation crop, cover crop, and bale grazing on steer performance, carcass measurements, and carcass value <https://www.ag.ndsu.edu/dickinsonrec/annual-reports-1/2016-annual-report/steer-bale-grazing-annual-rpt-v4.pdf>

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