

Building A *Working* Conservation Cropping System Focusing on Soil Health

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Making Soil Health A Priority!

- What does *Soil Health* mean?
- Soil Health Key Indicators =
 - Increasing organic matter
 - Improving aggregate stability
 - Increasing water infiltration
 - Increasing water-holding capacity
 - Improving nutrient cycling
 - Balancing and diversifying soil biology



Soil Health Principles



Conservation Cropping Systems

Key characteristic: Soil Microbial Diversity (Soil Biodiversity) biodiversity = most valuable property of any ecosystem [E.O Wilson, 1999]

Greater Biodiversity => Greater range of pathways for primary production and ecological processes (i.e., nutrient cycling); alternative pathways available if one is disturbed [Bob Kremer- Prof. of Soil Microbiology, University of Missouri]

Conservation Cropping Systems

Fully Functional No-Till= High Soil Health

Resilience!





Quality No-Till

Adapted Nutrient Management



Prescribed Cover Crops



Integrated Weed & Pest Management and Precision Technology



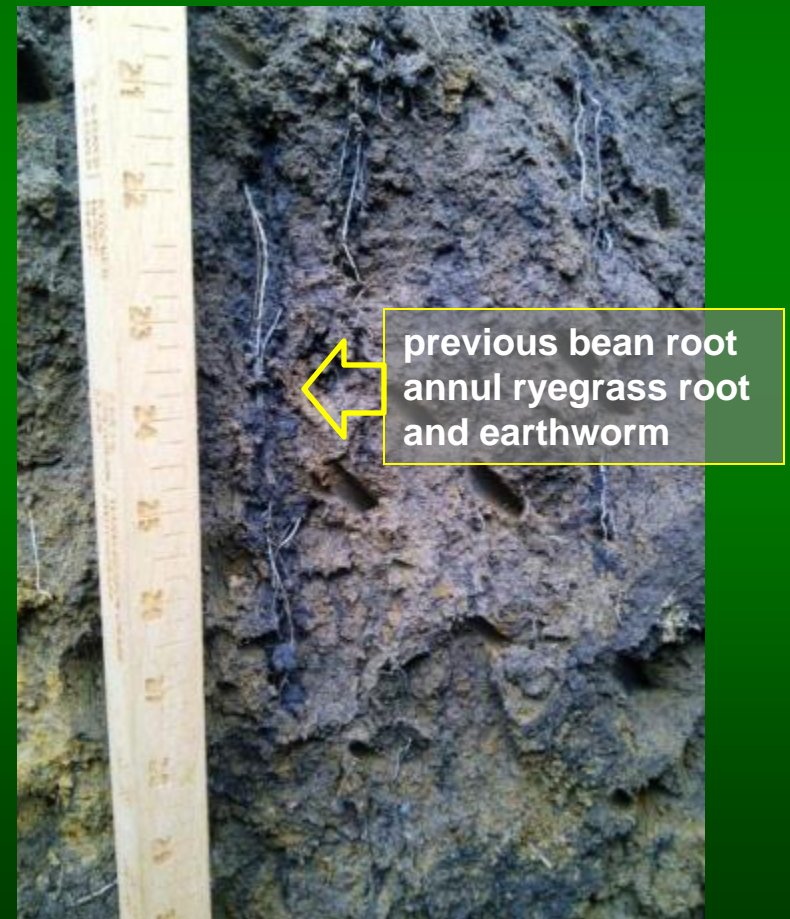
Diverse Crop Rotation

Where can we build reactive carbon?

Most occurs 0"-4"



Maybe it occurs
4" - 24" - "?"



How was the deep rich soil of the prairie formed?

Nature has provided the template



← 10 Years of C-SB continuous No-Till and 2 years of cover crops

Larry Strole,
Brook IN

Cover Crops

...Strategies for a Corn-Soybean Rotation

Strategically...

CC should complement the following crop

Corn or
Soybean



Strategically...

CC should complement the following crop

Corn after
High C (Corn)



Strategically...

CC should complement the following crop

Corn after
High C (Corn)
...or
High N (Protein)



Strategically...

CC should complement the following crop



Corn after
Cereal Rye?
...plus

Strategically...

CC should complement the following crop

Corn after
High C (Corn)
plus
High N (Protein)



Strategically...

CC should complement the following crop

Corn after
High C (Corn)



Strategically...

CC should complement the following crop

Corn after
High C (Corn)
plus
High N (Protein)



Strategically...

CC should complement the following crop

Corn after
High C (carbon)
and
High N (Protein)



Strategically...

Do Soybeans
need N ?
...Sure, but
they
capture
their own!



Strategically...

Do Soybeans
need N ?

...Sure, but they
capture their
own!



Strategically...

CC should match desired C:N Ratio

Material	C:N Ratio
rye straw	82:1
wheat straw	80:1
oat straw	70:1
corn stover	57:1
rye cover crop (anthesis)	37:1
rye cover crop (vegetative)	26:1
mature alfalfa hay	25:1
Balanced Microbial Diet	24:1
rotted barnyard manure	20:1
daikon radish	19:1
legume hay	17:1
beef manure	17:1
ryegrass (vegetative)	15:1
young alfalfa hay	13:1
hairy vetch cover crop	11:1
soil microbes (average)	8:1

Strategically...

Planning the system

1. Drill or VT
Cereal Rye into
Corn Stalks



Strategically...

Planning the system

1. Drill or VT Cereal Rye into Corn Stalks
2. Plant a short season Soybean into the Rye (preferably early in the season)



Strategically...

Planning the system



3. Plant a low
C:N mix
into or after
Soybean

Strategically...

Planning the system

4. NT Corn into
an N rich
healthy soil



All Genetic and Tech Advancements are
Greatest When Soil Health is Maximized

Capture the potential!



Mastering the Details is Key to Optimum Production

Capture the potential!



Mastering the Details is Key to Optimum Production

**“you’ll need many silver bullets...
...and a well planned system to keep them on target”**

Mastering the Details is Key to Optimum Production

“We can take production and conservation further with Conservation Cropping Systems that build Soil Health ”