PNDSA Cover Crop Case Study

Gabe Brown
Symptom: Pests
1,700 beneficial insect species for every 1 pest species!
Lady Beetles (Predators)
Buckwheat
Species to Use to Attract Beneficials:

<table>
<thead>
<tr>
<th>Grasses</th>
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- Hairy Vetch
- Clovers
- Woollypod Vetch
- Cowpeas
- Field Peas
- Fava Bean
Feeding the Whole
Soil Organic Matter is the “House” microbes live in, Water Extractable Organic Carbon is the “Food” they eat.

2% SOM, 12,000 ppm C

100-300 ppm C from water extract = microbial food
Fall Seeded Biennials
Option (Only in Emergency) – Having
Economics - 2006 Drought?
Combine
Option - Grazing
Mob Grazing High Carbon Biennials
Next Move
Carbon!
Soil Armor
Continue Regeneration
A key strategy in sustainable agriculture is to restore functional biodiversity of the agricultural landscape (Altieri, 1994).

Biodiversity performs key ecological services and if correctly assembled in time and space can lead to agroecosystems capable of sponsoring their own soil fertility, crop protection and productivity. (Altieri, 1994)
What About Yield Drag?

Too Many Make The Mistake Of Removing Fertilizer Usage Immediately. Cover Crops and The Biology They Enhance Are Made Up Of Nutrients. One Must Account For This Otherwise One Will Have A Yield Drag! Management, Management, Management!!!
Question: Can It Work Here?

• “Whether you think you can, or you think you can't--you're right.”

• Henry Ford
Covers Are Advancing Soils Everywhere!!

- Covers Are Working On Every Continent In The World Where There Is Production Agriculture!
David Brandt

- 60” Rainfall in 2011
- 225+ bu. Corn
- No Tile Drainage
- No Fertilizer
Mixed cover crops
Effects of mixed cover crops in continuous no-till on soil total nitrogen content under corn-soybean-wheat rotation

Dr. Islam 2012
Effects of mixed cover crops in continuous no-till on soil **active carbon** content under corn-soybean-wheat rotation

Dr. Islam 2012
Effects of mixed cover crops in continuous no-till on **soil moisture** storage under corn-soybean-wheat rotation

Dr. Islam 2012
Effects of mixed cover crops in continuous no-till on soil porosity content under corn-soybean-wheat rotation

Dr. Islam 2012
Darrin Williams, Waverly Kansas
Michael Thompson and Father
3 Year No-till vs. Conventional Till
No-till corn with cover crops made 58 bu/ac (on 7 in. of total rainfall)

Neighbor who conventional tilled corn made 5 bu/ac (he harvested it)

(“conventional till” corn planted into “worked” wheat stubble)
Ray McCormick: Indiana
Ray McCormick: Indiana
If One Focuses On Soil Health The Symptoms Are Taken Care Of!!
“If you want to make small changes, change how you do things. When you want to make major changes, change how you see things!”
Questions?
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- Website: brownsranch.us
Same Soils: Dynamic Soil Properties Changed!

Forest SOM = 4.3%

Soybean monoculture SOM = 1.6%

62.8% loss of SOM after 17 yr intensive tillage

20 cm layer

Forest SOM = 4.3%

17 yr- Soybean monoculture SOM = 1.6%
Utilize energy efficiently - understand the power of diversity: **Collaboration** is more apparent than **Competition**: ND case study: 2006 Production On Burleigh District Plot with 1.8 in. of rain
Last 50 acres of corn on home farm planted 5-25 in chest high rye
Double crop beans harvested in late November, drilled rye, spring 4000 gal hog manure applied in mid April.
DIVERSITY!
Diversity Above Ground
Diversity Below Ground

- Fibrous Roots
- Tap Roots
- Shallow
- Intermediate
- Deep
Living Root As Long As Possible

- Must Continue The Liquid Carbon Pathway.
- Cannot Afford To Not Have Living Roots!
• Fill Every Window You Can!
Cowpea/ProsoMillet/Buckwheat
Seeded 8/15 Following Oat Harvest
Colin Seis – No Kill Cropping
Symptom: Pests
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Colin Seis – No Kill Cropping
Residue Prior to Corn Planting 5/15
No-Till Planting Through Heavy Residue
Trash Whippers Lifted
When I Say Zero-Till: I MEAN Zero-Till!!
Brown’s Ranch
Same Field

June 16, 2009

July 1, 2009
Rapid residue decomposition