

Investing In Our Future Through Conservation Tillage



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Business Growth requires maximum utilization and efficiency of:



- Labor
- Management
- Equipment
- Infrastructure
- Production must increase



No-Till and Strip-Till systems may offer the greatest opportunities!

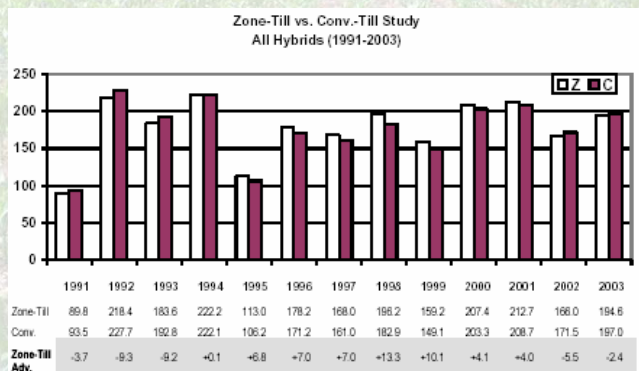



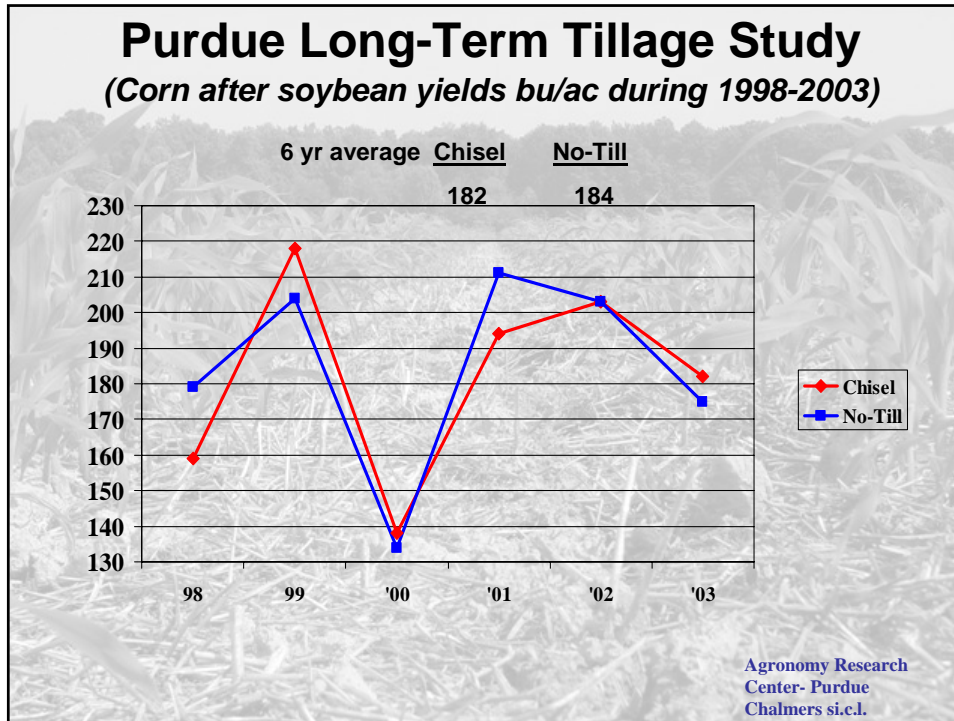
Side by side yield comparisons of no-till and conventional tillage systems have been done at many locations, on many soil types across the Corn Belt with few showing any statistical yield difference under a corn – soybean rotation.

Beck's Yield Averages

	Conventional	Zone-till
– 13yr	175.9	177.6
– 10yr	177.3	181.8

13 year No-till Advantage **+1.7 bu/ac**
 10 year No-till Advantage **+4.5 bu/ac**





At the same time most economic analyses have shown input costs to be \$12- \$34/ac. less for no-till systems.

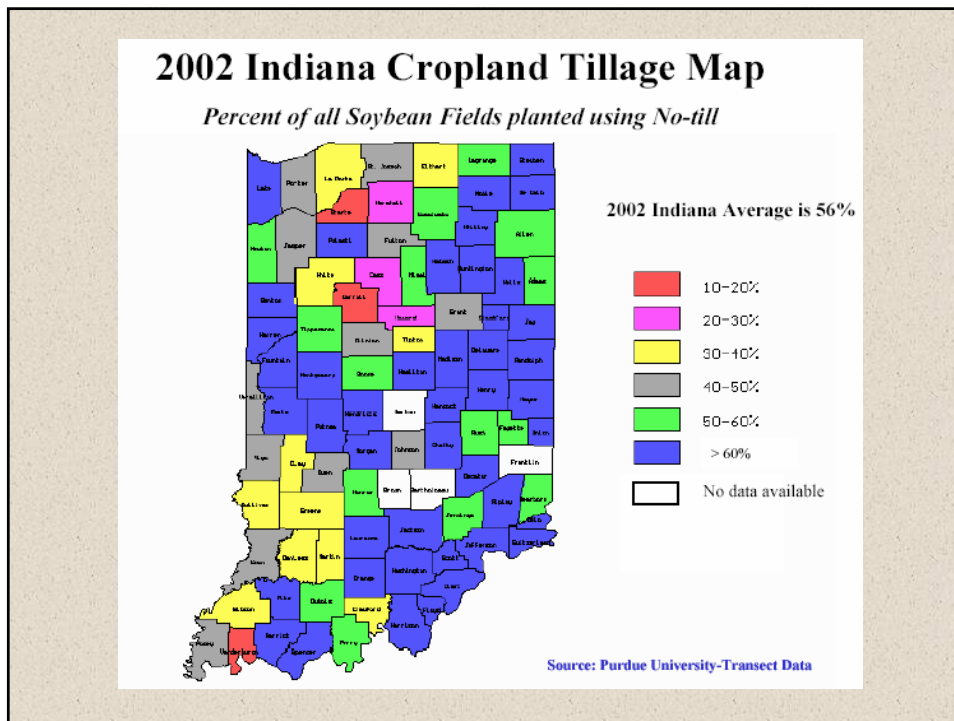
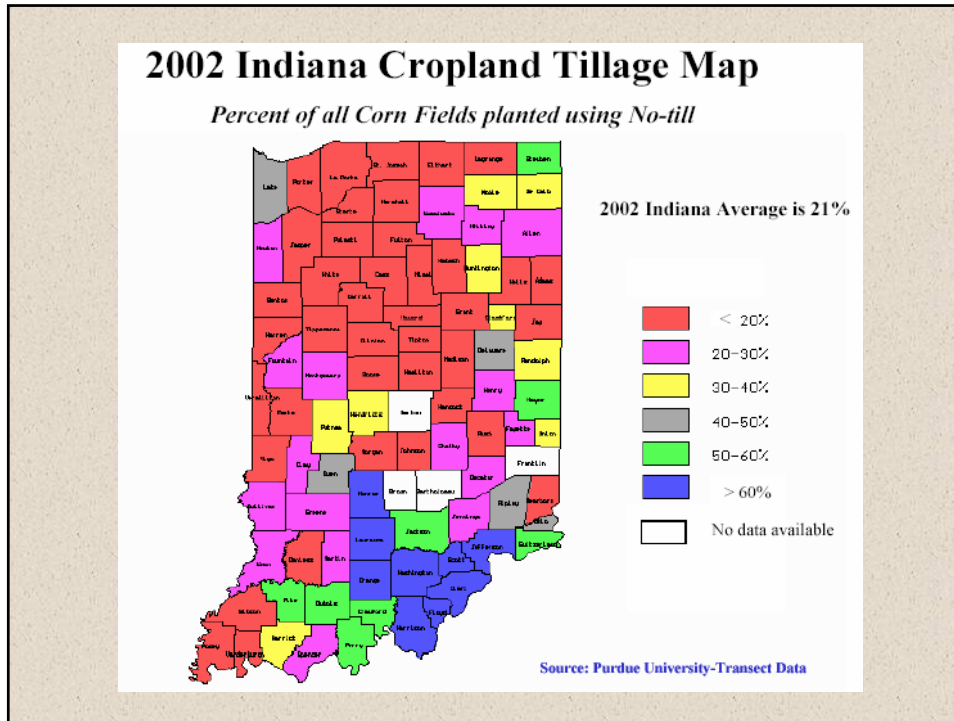
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What does this mean for a 1000 ac. farm?



- A USDA study has shown a savings of 30 minutes/ac./yr. to prepare and plant a crop for no-till.
- That's 50 extra work days a year to devote to marketing, management, additional acres or, better yet, family.





Proceedings of Indiana Crop Adviser Conference 2004

Division of Soil Conservation - Microsoft Internet Explorer

Address: <http://www.in.gov/dnr/soilcons/publications/transsect.html>

Division of Soil Conservation

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2004 Conservation Tillage Reports
 A total of 90 counties participated in the 2004 Tillage Survey. To view the percentage of no-till corn and soybean by county, click below.

Adams	Fulton	Madison	Shelby
Allen	Gibson	Marshall	Spencer
Bartholomew	Grant	Martin	St. Joseph
Benton	Greene	Miami	Starke
Blackford	Hamilton	Monroe	Steuben
Boone	Hancock	Montgomery	Sullivan
Carroll	Harrison	Morgan	Switzerland
Cass	Hendricks	Newton	Tippecanoe
Clark	Henry	Noble	Tipton
Clay	Howard	Ohio	Union
Clinton	Huntington	Orange	Vandeburgh
Crawford	Jackson	Owen	Vermillion
Davies	Jasper	Parke	Vigo
DeKalb	Jay	Perry	Wabash
Dearborn	Jefferson	Pike	Warren
Decatur	Jennings	Porter	Warrick
Delaware	Johnson	Posey	Washington
Dubois	Knox	Pulaski	Wayne
Elkhart	Kosciusko	Putnam	Wells
Fayette	LaPorte	Randolph	White
Floyd	Lagrange	Ripley	Whiteley
Fountain	Lake	Rush	
Franklin	Lawrence	Scott	

Division of Soil Conservation - Microsoft Internet Explorer

Address: <http://www.in.gov/dnr/soilcons/publications/tillagereports/montgomery.html>

[Back to County List](#)

Montgomery County

2004 Cropland Tillage Data - Corn

ACREAGE IN NO-TILL: 33,089

NO-TILL (30%)
MULCH TILL (19%)
CONVENTIONAL (51%)

No-till - Any direct seeding system, including strip preparation, with minimal soil disturbance.

Mulch Till - Any tillage system leaving greater than 30% crop residue cover after planting, excluding no-till.

Conventional - Any tillage system leaving less than 30% crop residue cover after planting.

2004 Cropland Tillage Data - Soybean

ACREAGE IN NO-TILL: 101,700

NO-TILL (88%)
MULCH TILL (9%)
CONVENTIONAL (2%)

No-till - Any direct seeding system, including strip preparation, with minimal soil disturbance.

Mulch Till - Any tillage system leaving greater than 30% crop residue cover after planting, excluding no-till.

Conventional - Any tillage system leaving less than 30% crop residue cover after planting.

2004 Tillage Transect Results

2004 Corn – Ranked By Acreage of No-Till Acres					
Rank	County	Tillage Type (Acres)			
		No-till	Mulch-till	Reduced-till	Conventional
1	Randolph	39689	2111	14778	19844
2	Wayne	34870	2657	8635	15941
3	Jackson	33440	0	2623	21310
4	Montgomery	33089	21411	0	55473
5	Knox	30251	16806	0	79830
6	Rush	30197	2253	37408	40112
7	Delaware	29382	2784	16392	13299
8	Dubois	28111	2279	4052	22539
9	Washington	27712	1807	2811	4016
10	Putnam	27226	2723	10210	17697
11	Bartholomew	27193	7931	5288	26438
12	Shelby	22906	9432	9432	46710
13	Fountain	21017	1751	5692	64364

We should expect high yields with
High Residue Cropping Systems

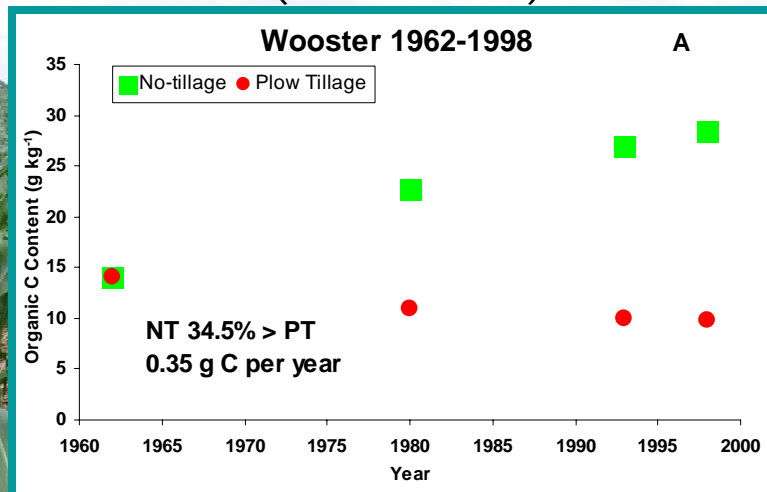




Nitrogen Management in No-Till Corn

In order to manage N we must first understand the changes in Carbon and Nitrogen cycles under No Tillage

Wooster OH Carbon Study (0-2 inches)



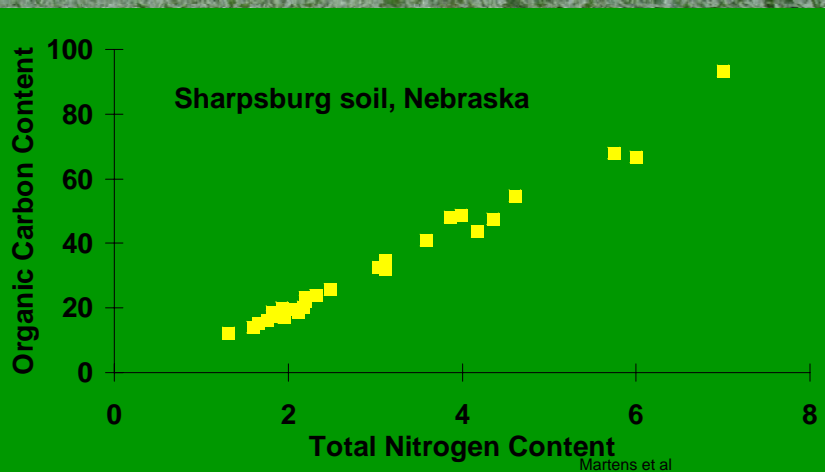
Continuous corn

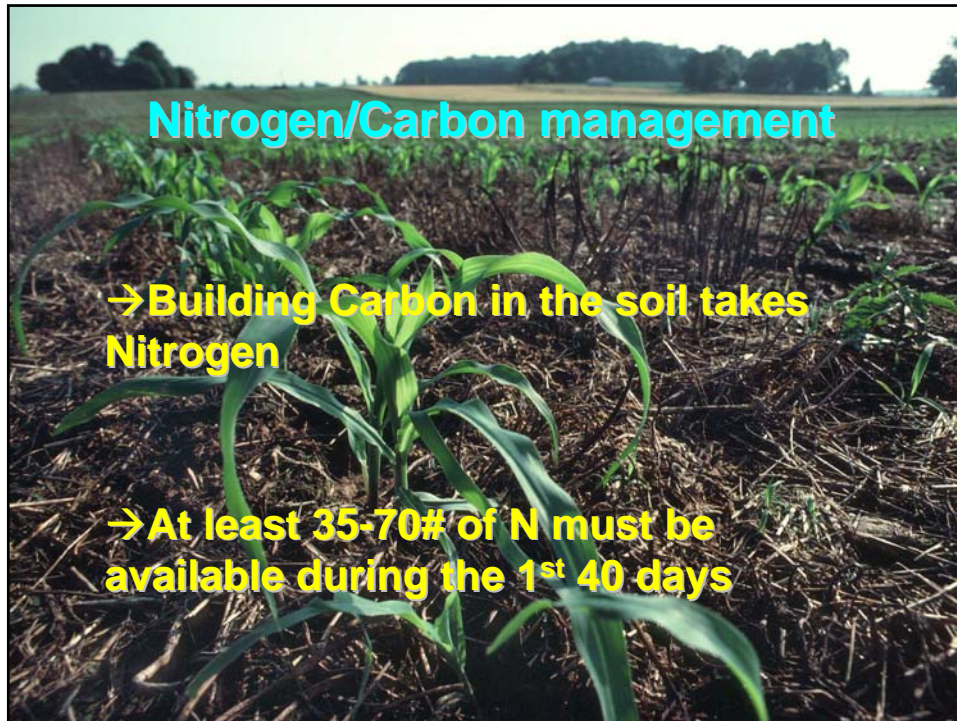
Martens et al.

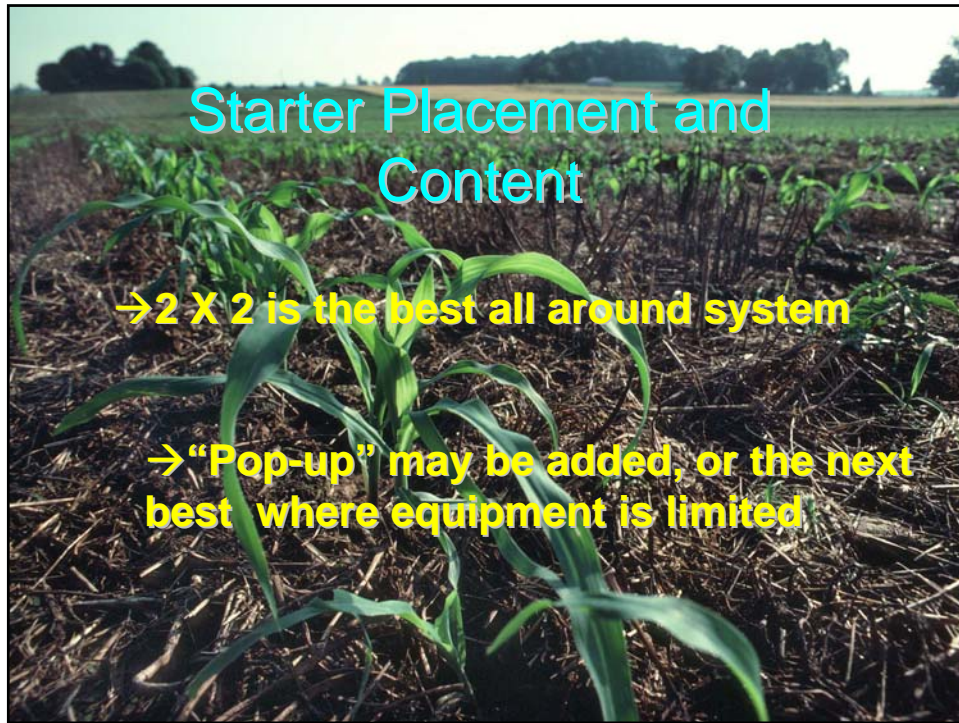
Corn Fertility

- General rule of thumb- 20# of N is mineralized from every 1% of organic matter.
- To get this mineralization a relative amount of CO₂ must be released
- Mineralization happens later in the season in No-Till

Organic Carbon to Total Nitrogen Relationship (Silty soil, 130 years)

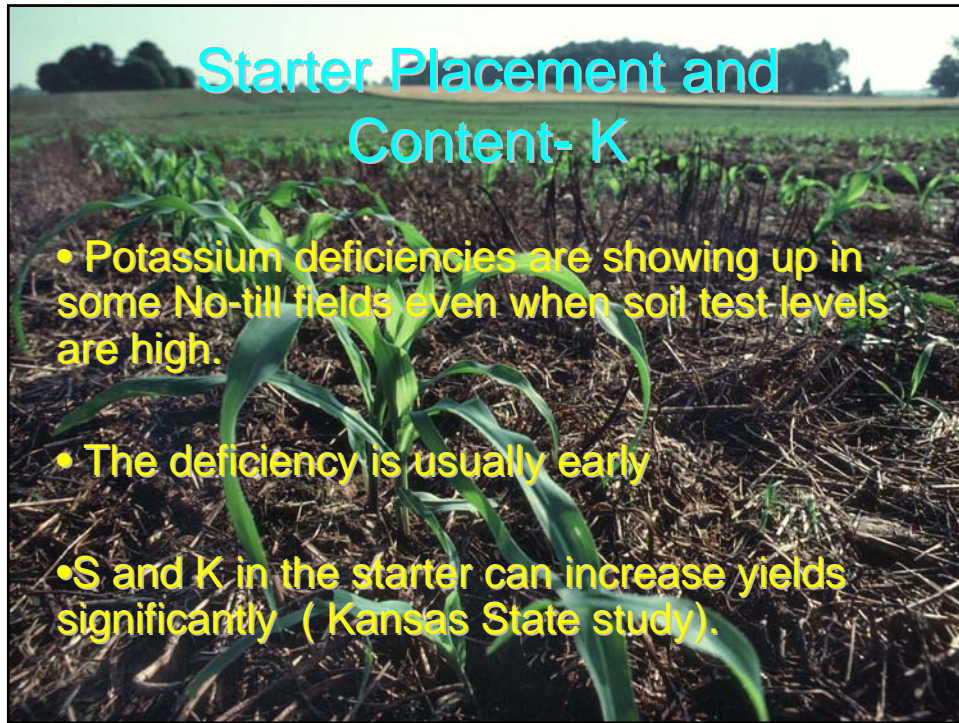






Starter Placement and Content- K

- Potassium deficiencies are showing up in some No-till fields even when soil test levels are high.
- The deficiency is usually early
- S and K in the starter can increase yields significantly (Kansas State study).



We Can Successfully Improve Soil Quality with High Residue Cropping Systems and Cover Crops



Soil Quality is improved by no-till and use of cover crops.

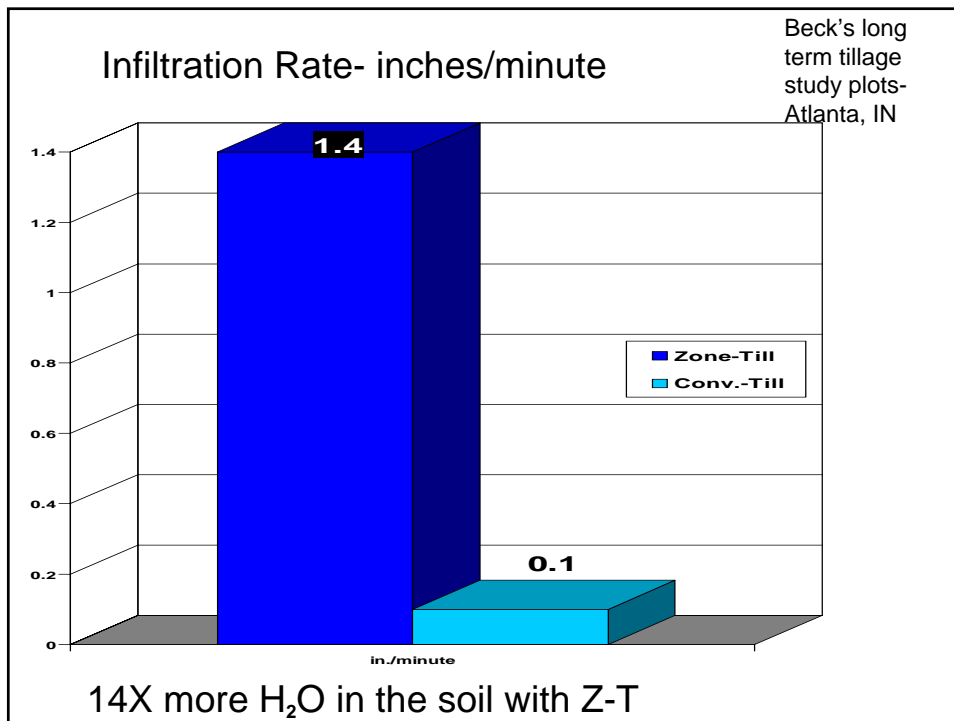
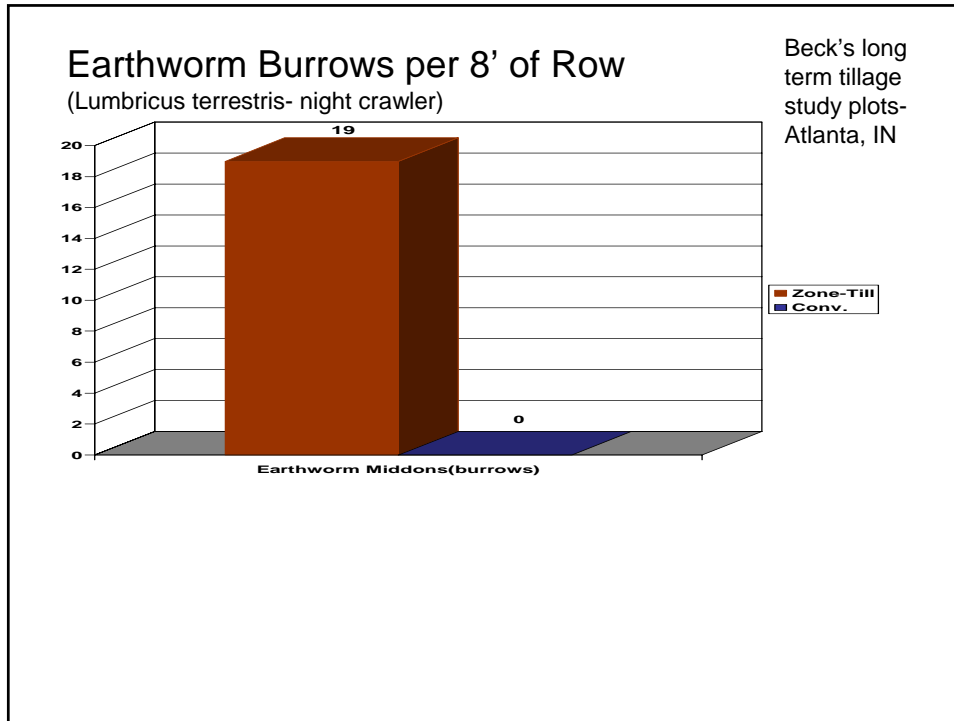


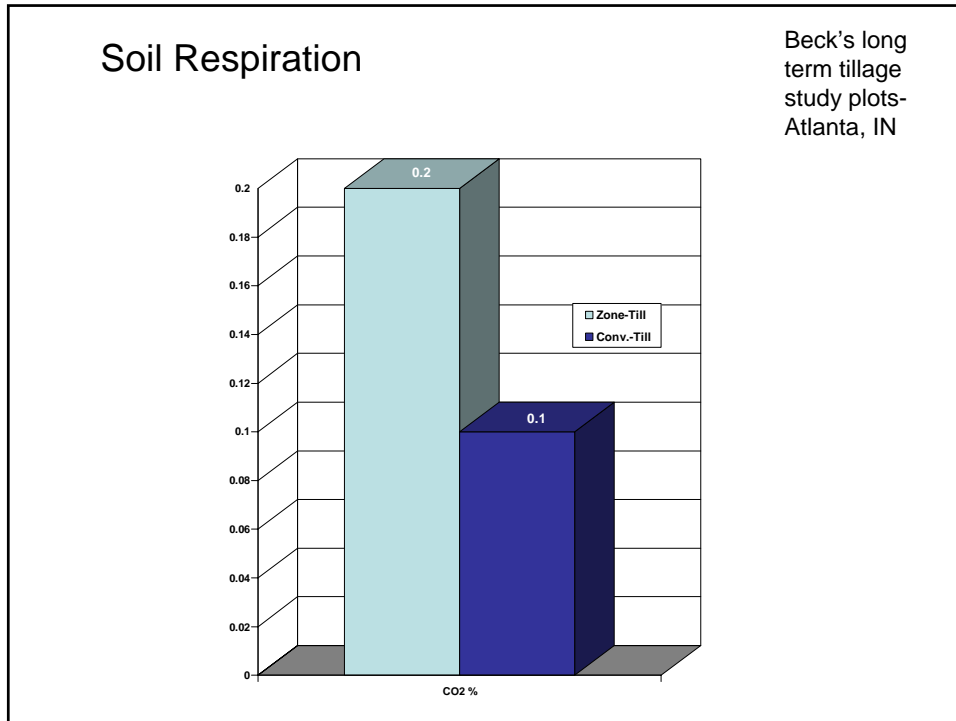
How...?

- Improve soil structure
- Improved soil drainage
- Increased organic matter
- Improved soil tilth
- Reduced erosion
- Reduced weed pressure
- Improved soil moisture.



How many
Government
Soil Scientists
does it take to
find an
earthworm?
Only 1... with 4
to properly
record the
event.





Annual Ryegrass Cover Crop



“Two Dans Diggin”

**Drilled at
15 lbs./ac.**

**Annual Ryegrass
April 8
Dan DeSutter Farm,
Fountain Co.**



The image shows two men, Dan DeSutter and another man, kneeling in a field next to a deep trench they have dug. They are wearing hats and work clothes. In the background, a yellow excavator is visible. The field is green with grass.

Annual Ryegrass Cover Crop



Aerial seeded Sept. 9

30 lbs./ac.

**Stand less uniform
than drilled**

**Top growth and root
growth on 4/8/04
similar to drilled**



Annual Ryegrass Cover Crop



**DeSutter Farm-
Fountain Co.**

**Drilled on Oct. 1 at
15 lbs./ac.**

**Roots down to 51"
on April 8**



Annual Ryegrass Cover Crop



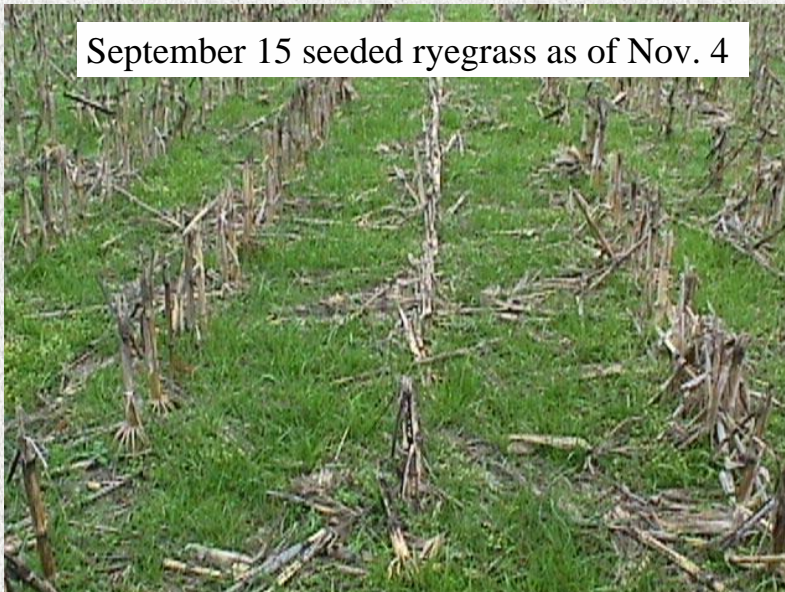
Benefits reach maximum at 9” of growth –on or around 4/8/04

- Maximum N content of top growth- + or – 18%
- Maximum root growth- 30” +



Cover crop work by Mike Plumer
University of Illinois Extension

September 15 seeded ryegrass as of Nov. 4





Soybean root development
under ryegrass cover



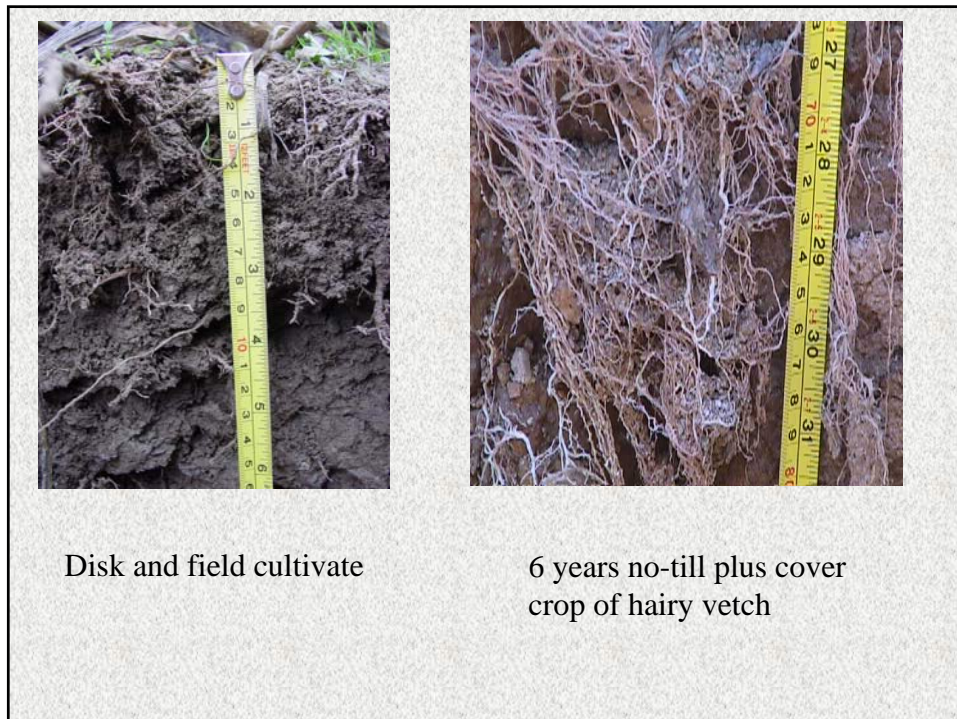
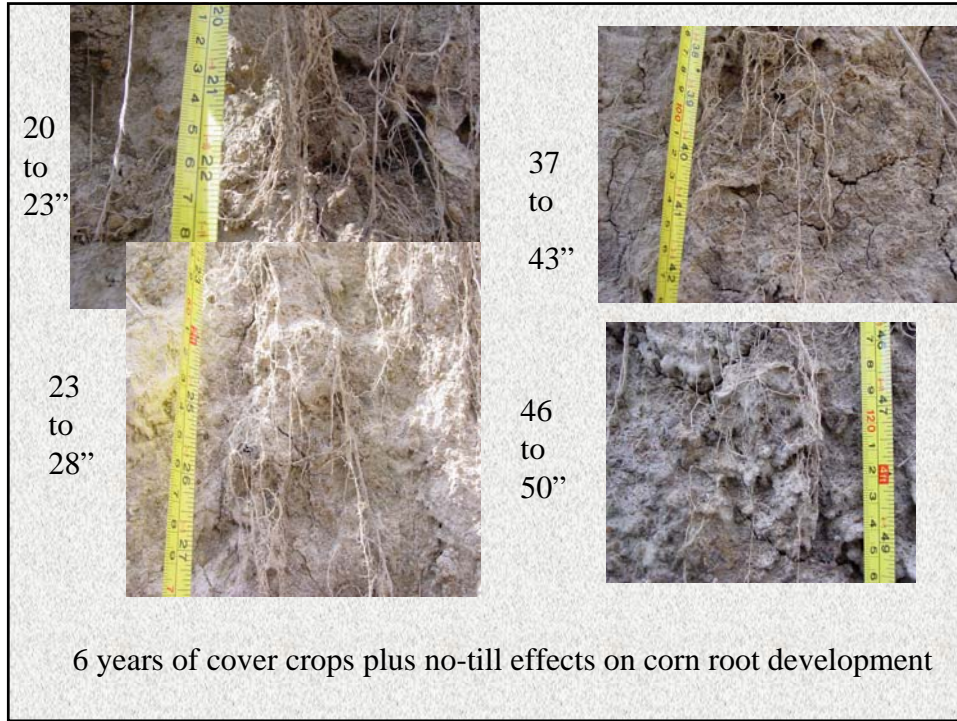
Soybean root following
previous root channel



Corn root mass in Bluford soil under no-till and vetch/ryegrass cover crop



Corn root mass under ryegrass cover crop in drought year



New Research for Soybeans

- White mold can be significantly reduced by cover crops.
- Many *Brassicas* (canola, radish, etc.) are natural nematicides.
Using them in rotation or as a cover crop can greatly reduce soybean cyst nematode populations.

