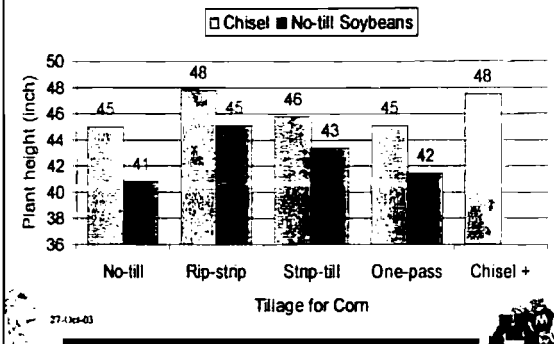


**Corn following soybean treatments**

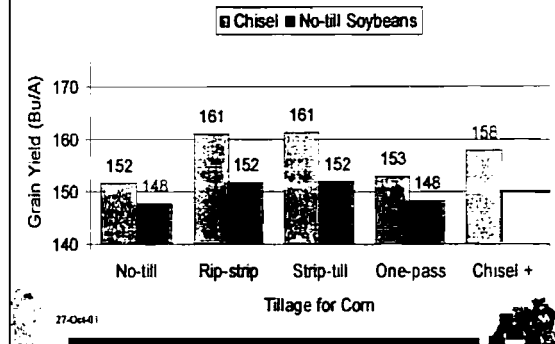
Trt #	Tillage for *	
	Soybean	Corn
1	No-till	No-till
2	Chisel +	-
3	No-till	Rip-strip
4	Chisel +	-
5	No-till	Fall strip-till
6	Chisel +	-
7	No-till	One-pass
8	Chisel +	-
9	Chisel +	Chisel

\* With or without row cultivation for corn

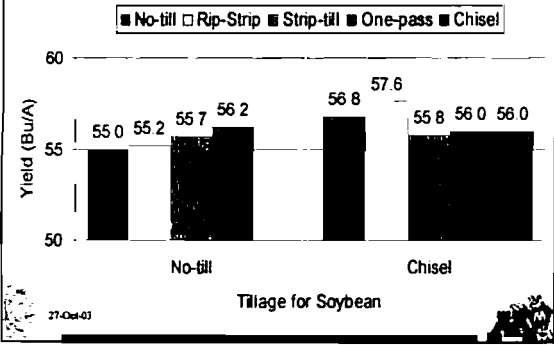
Early growth of corn as affected by rotational and deep zone-tillage at Waseca, 2000-02.



Corn yield as affected by rotational and deep zone-tillage at Waseca, 2000-02 (3-yr avg).



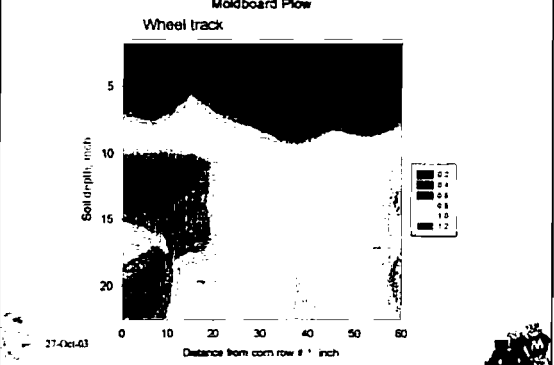
Soybean yield as affected by rotational tillage at Waseca, 2000-02 (3-yr avg).



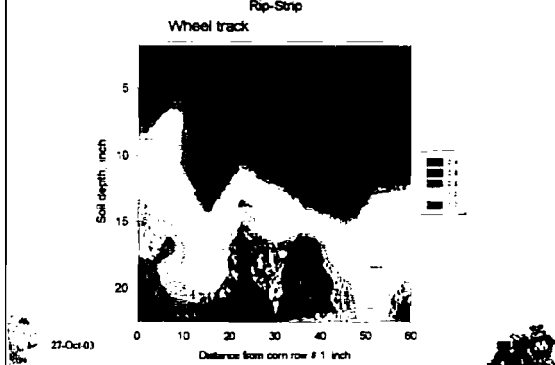
Tillage for 2<sup>nd</sup> year corn treatments

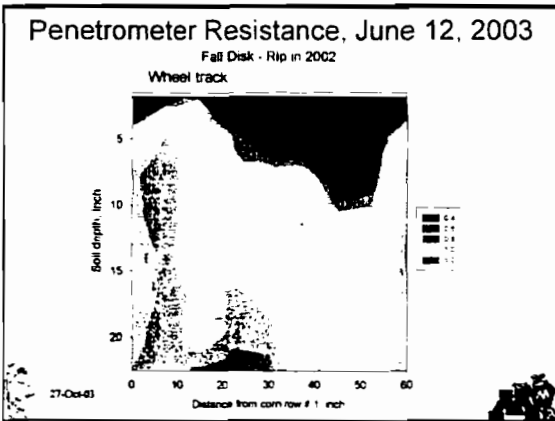
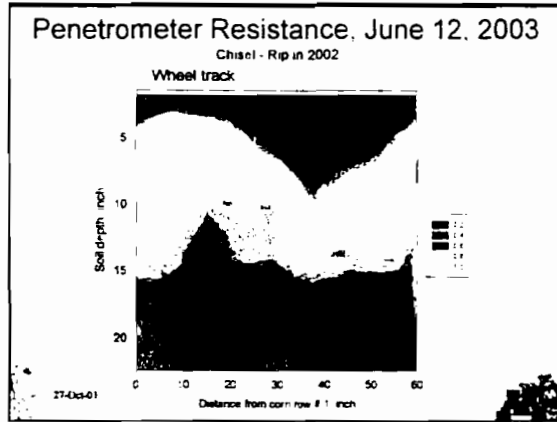
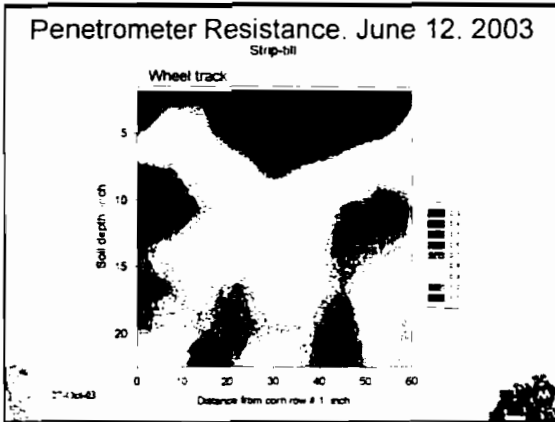
Trt #	Tillage for		
	Soybean in 2001	Corn in 2002	2 <sup>nd</sup> Year Corn in 2003
1	No-till	No-till	No-till
2	Chisel +		Rip-strip
3	No-till	Rip-strip	Rip-strip
4	Chisel +		
5	No-till	Fall strip-till	Fall strip-till
6	Chisel +		
7	No-till	One-pass	One-pass
8	Chisel +		
9	Chisel +	Chisel +	Chisel +
10	No-till	No-till + RC	Fall disk
11	Chisel +		Chisel +
12	No-till	Rip-strip + RC	Fall disk
13	Chisel +		Chisel +
14	No-till	Fall strip-till + RC	Fall disk
15	Chisel +		Chisel +
16	No-till	One-pass + RC	Fall disk
17	Chisel +		Chisel +
18	Chisel +	Chisel + RC	Moldboard plow +

Penetrometer Resistance, June 12, 2003  
Moldboard Plow



Penetrometer Resistance, June 12, 2003  
Rip-Strip





**Subsoiling**  
(Ext. Bulletin FO-03115)

<http://www.extension.umn.edu/distribution/cropsystems/DC3115.html>

27-Oct-03

- Effects of subsoiling**
- In the Midwest, research results evaluating the effects of subsoiling have shown few positive yield responses to subsoiling. When they do occur, they are variable and relatively small.
  - In a Waseca study, subsoiling to a depth of 16 inches failed to increase yields on the 20-ton per axle treatments for either corn or soybeans and decreased corn yield 11 bu/A in one of the two years.
- 27-Oct-03

- Why no yield response to subsoiling?**
- Detrimental effects caused by compaction were no longer limiting crop yield.
  - Subsoiling failed to effectively remove the compaction because of unfavorable soil moisture conditions at the time of subsoiling.
  - Subsequent wheel traffic may have reintroduced the compacted layer.
- 27-Oct-03

### What should I do?

- Determine if a compaction problem actually exists (symptoms: standing water etc.).
- Determine if subsoiling can effectively disrupt the compacted layer.
- Make sure soil is dry and fractures to the depth of tillage (shank).
- Avoid recompacting loosened soil by using controlled traffic if possible.

27-Oct-03

### Thanks Questions / Comments

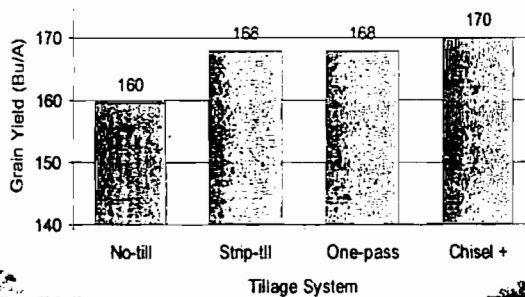
Jeff Vetsch

Southern Research and Outreach Center

<http://sroc.coafes.umn.edu/>

27-Oct-03

Corn yield as affected by tillage system at Waseca, 1997-02 (20-site-yr avg).



27-Oct-03

Corn yields as affected by tillage at various yield levels at Waseca.\*

Yield Level	Tillage for Corn following Soybean				Change Hi:Low
	No-till	Strip-till	One-pass	Chisel +	
Corn Grain Yield (bu/acre)					
Low	111	120	122	125	11
Med	139	144	145	147	6
High	161	165	165	167	4
V High	182	195	190	193	6
Avg	148	156	156	158	6

27-Oct-03

\* Each level is the average of 5 site-yr with check plots (zero N and very low P included)

**PROCEEDINGS OF THE  
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NORTH CENTRAL  
EXTENSION-INDUSTRY  
SOIL FERTILITY CONFERENCE**

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