Drainage and Tillage Effect on Corn Production

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Objective

To evaluate the effect of soil drainage and tillage on corn production.

Background

Cooperator:	O.A.R.D.C. NW Branch	Fertilizer: 200 # 10-26-26, sidedress 28% N @ 33 Gal/ac	
County:	Wood		
Nearest Town:	Hoytville	Planting Date:	6-4-11
Drainage:	see below	Planting Rate:	30,000
Soil type:	Hoytville, clay	Row Width:	30 in
Tillage:	see below	Herbicides:	Cinch, Prequel, Honcho, 2,4-D, Roundup Weathermax
Previous Crop:	soybean		
Variety:	Becks 5354HXR	Harvest Date:	12-12-11
Soil test:			

Methods

The entries were replicated eight times in a randomized complete block design. Plot size- 10 feet x 60 feet each entry. Harvest data collected from center rows. The same crop was planted on all treatments on the same day, using the same variety, fertility, and herbicide.

Drained plots have subsurface tile drainage spaced 20 feet apart compared to undrained plots which do not have subsurface drainage. Both sets of drainage plots contain four identical tillage treatments.

1. Continuous no-till
2. Fall Strip Tillage – a 6 in deep mole knife with mounding coulters
3. Fall Zone Tillage – a 12 to 18 inch deep straight shank subsoiler, no further tillage
4. Fall chisel plow – followed by fall roterra finish tillage

Rainfall at this location:

	2011	long term average (29 year)
June	1.40 in	3.6 in
July	4.29 in	3.8 in
August	3.74 in	3.0 in
Total	9.43 in	10.4 in

RESULTS 2011 Corn Yields bushels / acre

Drainage	Tillage	Yield	Significance	LSD (.05)
Drained	No-till	169.8		
Undrained	No-Till	162.9	NS	
Drained	Strip-till	167.8		
Undrained	Strip-till	165.3	NS	
Drained	Zone-till	166.0	NS	
Undrained	Zone-till	161.3		
Drained	Chisel Plow	141.1	A	
Undrained	Chisel Plow	168.7	B	(13.4)

Summary

The chisel plow treatment was the only significant difference in yield due to drainage. All other treatments did not show any difference in yield due to drainage.

Because of an extremely wet May, corn was planted later than usual (June 4) and the soil moisture was essentially at field capacity below planting depth. Then rainfall during June was 2.2 inches below normal. A drier growing season tends to negate the usual yield advantage resulting from good subsurface drainage.

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