

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:	150 # 18-46-0, sidedress 28% N @ 50 Gal/ac
County:	Wood	Planting Date:	4-21-10
Nearest Town:	Hoytville	Planting Rate:	30,000
Drainage:	see below	Row Width:	30 in
Soil type:	Hoytville, clay	Herbicides:	Lexar, Princep, 2,4-D, Glyphosate, AMS
Tillage:	see below	Harvest Date:	9-27-10
Previous Crop:	soybean		
Variety:	Pioneer PO518XR		
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 rotterra finish tillage

Rainfall at this location:

	2010	long term average
June	3.96 in	3.7 in
July	2.37 in	3.8 in
August	1.68 in	3.0 in
Total	8.01	10.5

RESULTS

2010 Corn Yields bushels / acre

Drainage	Tillage	Yield	Significance	LSD (0.10)
Drained	No-till	135.6	A	
Undrained	No-Till	108.9	B	(9.0)
Drained	Strip-till	140.0	A	
Undrained	Strip-till	110.1	B	(5.5)
Drained	Zone-till	135.7	NS	
Undrained	Zone-till	125.5		
Drained	Chisel Plow	128.5	A	
Undrained	Chisel Plow	92.4	B	(15.9)

Summary

This experiment has been conducted for over 20 years. The corn was planted timely (April 21) and an extremely wet month of May showed the importance of good drainage in corn production. In 2010 corn yield was significantly better with drainage in the No-till, Strip-till, and chisel plow treatments compared to undrained. The undrained zone till treatments allowed the soil to also have a loose soil structure which enhances drainage.

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