

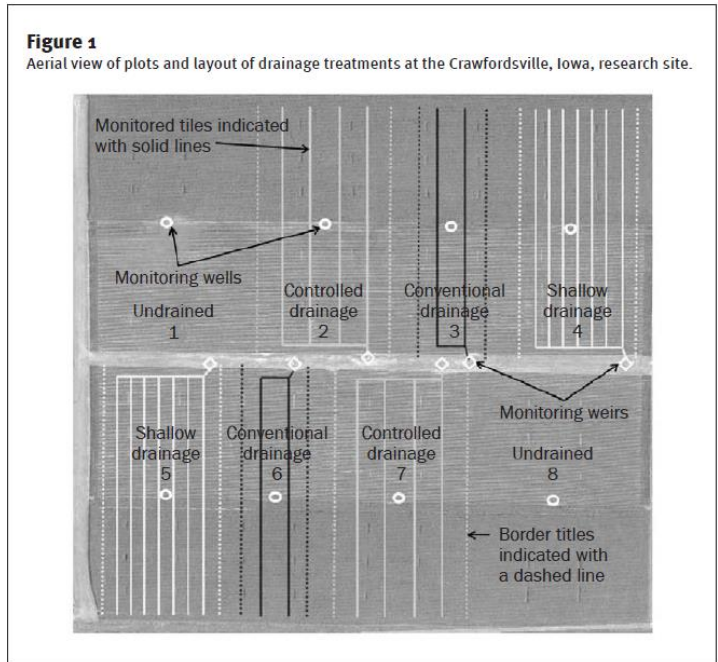


Drainage Water Management in Southeast Iowa (2012)

Researchers at Iowa State University developed a site in 2007 to compare how different drainage practices (Undrained/surface-only drained, Conventional Drainage, Controlled Drainage, and Shallow Drainage) influence factors such as water table level, drainage volume, Nitrate loading, and yield in a corn/soybean rotation, typical throughout the Midwest.

The Site

- Southeast Iowa – Crawfordsville, IA
- 3- to 6-acre plots (42 acres total)
- Soils (poorly drained)
 - North: *Kalona silty clay loam*
 - South: *Taintor silty clay loam*
- Crops
 - Corn/soybean rotation
- Drainage Practices
 - Undrained/Surface Drainage only
 - Conventional Drainage
 - 4' depth, 60' spacing
 - Controlled Drainage
 - 4' depth, 60' spacing
 - Stoplogs placed during growing season; removed for fieldwork
 - Shallow Drainage
 - 2.5' deep, 40' spacing



The Testing

- For 4-year period (2007 – 2010) measurements taken for:
 - Rainfall
 - Drainage flow
 - Water Table depth
 - Nitrate concentration
 - Crop yield

The Results

- Similar drainage outflow from Shallow and Controlled Drainage plots
 - About 40% reduction from Conventional
- Less flow volume = Less Nitrate loading
 - Concentrations remain similar, but slightly higher with Shallow Drainage
- Conventional drainage yielded highest, Undrained yielded lowest
 - Not always consistent, not always significant
- Wet 4-year stretch, but rainfall timing and amount varied

	Drainage (in)	Flow Diff. from Conventional Drainage	Avg yearly NO3-N Load (lb/ac)
Conventional	14.6	-	31
Controlled	9.06	38%	19
Shallow	7.87	46%	21
	4-yr Avg.	30-yr Avg.	
Precipitation	43.4	38.3	

The Takeaway

This side-by-side comparison of 4 drainage practices in typical farming operation (multiple soil types, corn/soybean rotation, etc.) confirms many long-held beliefs: water management systems can increase yield, controlled drainage and shallow drainage can reduce overall water leaving the site, thus reducing nitrate loading downstream. However, rainfall amount and timing can play a large role in how effective each of these practices are.



One of the more intriguing findings in research is the similarities of controlled drainage and shallow drainage systems. Through 4 years of data, results point to similar yield and nitrate loading benefits between the two. Shallow Drainage may be an economical tool to reduce negative impacts of water quality and quantity.

This is a great site with important data, more time may be needed for to better confirm results.

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Citation:

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