Test Sites, Study Areas, Practices and Crops, Release 2.0: 5-10-2017

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013007069	Algoazany et al. 2007

Location		Vermilion County	IL	US

Study Citation	2007
	Algoazany, A.S., P.K. Kalita, C.F. Czapar, and J.K. Mitchell.
	Phosphorus Transport through Drainage and Surface Runoff from a Flat Watershed in East Central Illinois, USA
	J. Environ. Qual. 36:681-693
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Illinois and Iowa Deep Loess and Drift, Eastern Part
HUC_10	0512010810
Test Site Scale	Field
Experimental Design Type/ Description	Multiple Treatments, No Control, No Replication
	The objective of this study was to assess the fate and transport of soluble phosphorus (soluble P) through subsurface drainage and surface runoff at four sites
Crops	Corn, Soybeans
Study Duration	7 years

Summary

A long-term water quality monitoring program was established to evaluate the effects of agricultural management practices on water quality in the Little Vermilion River (LVR) watershed, IL. This watershed has intensive random and irregular subsurface drainage systems. The objective of this study was to assess the fate and transport of soluble phosphorus (soluble P) through subsurface drainage and surface runoff. Four sites (sites A, B, C, and E) that had subsurface and surface monitoring programs were selected for this study. Three of the four study sites had corn (Zea mays L.) and soybeans (Glycine max L.) planted in rotations and the other site had seed corn and soybeans. Subsurface drainage and surface runoff across all sites removed an average of 16.1 and 2.6% of rainfall, respectively. Annual flow-weighted soluble P concentrations fluctuated with the precipitation, while concentrations tended to increase with high precipitation coupled with high application rates. The long-term average flow-weighted soluble P concentrations in subsurface flow were 102, 99, 194, and 86 ug/L for sites A, B, C, and E, respectively. In contrast, the long-term average flow-weighted soluble P concentrations in surface runoff were 270, 253, 534, and 572 ug/L for sites As, Bs, Cs, and Es, respectively. These values were substantially greater than the critical values that promote eutrophication. Statistical analysis indicated that the effects of crop, discharge, and the interactions between site and discharge and crop and discharge on soluble P concentrations in subsurface flow were significant (a = 0.05). Soluble P mass loads in surface runoff responded to discharge more consistently than in the subsurface flow. Subsurface flow had substantially greater annual average soluble P mass loads than surface runoff due to greater flow volume.

Study ID	**201300706901**	**Study Area**	**A**	Area (ha)	6.00	Tillage	Reduced Tillage	Cover Crop	None
Practice ID	1	Practice Name	A Cons Till	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CT-CS-EN			
Irrigation	NR	Irrig. Descrip.	Not applicable						
Soils	Silty Clay Loam- Drummer, Silty Loam- Flanagan								
Fertilizer	Phosphorus was applied after crop harvest at sites A, B, and C, and was applied before planting at site E.								
Comments	Fields at sites A and B were chisel-plowed and disked or field-cultivated every year.								

Crop 1 Corn, soybean rotation Yield -999999

Study ID	**201300706902**	**Study Area**	**B**	Area (ha)	3.00	Tillage	Reduced Tillage	Cover Crop	None
Practice ID	2	Practice Name	B Cons Till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.	Not applicable						
Soils	Silty Clay Loam- Drummer, Silty Loam- Flanagan								
Fertilizer	Phosphorus was applied after crop harvest at sites A, B, and C, and was applied before planting at site E.								
Comments	Fields at sites A and B were chisel-plowed and disked or field-cultivated every year.								

Crop 2 Soybean, corn rotation Yield -999999

Study ID	**201300706903**	**Study Area**	**C**	Area (ha)	3.90	Tillage	Reduced Tillage	Cover Crop	None
Practice ID	3	Practice Name	C Cons Till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.	Not applicable						
Soils	Silty Clay Loam- Drummer, Silty Loam- Flanagan								
Fertilizer	Phosphorus was applied after crop harvest at sites A, B, and C, and was applied before planting at site E.								
Comments	Tillage practices at site C included disking and field cultivation.								

Crop 3 Soybean, corn rotation Yield -999999

Study ID	**201300706904**	**Study Area**	**E**	Area (ha)	2.31	Tillage	No Till	Cover Crop	None
Practice ID	4	Practice Name	E No Till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCN-NT-CS-EN				
Irrigation	NR	Irrig. Descrip.	Not applicable						
Soils	Silty Loam- Sabina, Xenia								
Fertilizer	Phosphorus was applied after crop harvest at sites A, B, and C, and was applied before planting at site E.								
Comments	Site E had NT throughout the study period.								

Crop 4 Corn, soybean rotation Yield -999999

Test Site ID	Test Site Name
2016001012	**Angle et al. 1984**

Location		Howard	MD	US
Study Citation	1984			
	Angle, J.S., McClung, G., McIntosh, M.S., Thomas, P.M., Wolf, D.C.			
	Nutrient Losses in Runoff from Conventional and No-Till Corn Watersheds			
	Journal of Environmental Quality			
NRCS LRR	Northern Atlantic Slope Diversified Farming Region			
NRCS MLRA	Northern Piedmont			
HUC_10	0206000602	Test Site Scale	Subwatershed (500-1,000 acres)	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
Crops	Corn			
Study Duration	3 years			

Summary

A study was initiated to determine the quantity of nutrients and sediment in runoff from conventional and no-till corn (Zea mays L.) watersheds. Parameters measured in runoff included NH4+-N, NO3--N, total N, ortho-PO4, total soluble P, total P, suspended sediment, and soluble solids. There was a significant difference in total runoff between the conventional and no-till watersheds.

Study ID	**201600101201**	**Study Area**	**Conventional**	Area (ha)	0.37	Tillage	Conventional	Cover Crop	
Practice ID	1	Practice Name	Conventional	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Manor loam (coarse loamy, micaceous, mesic Typic Dystrochrept)								
Fertilizer	Dry fertilizer had been applied to both Dry fertilizer, not incorporated into the soil.								
Comments									

Crop	1	Corn	Yield
Crop	2	Corn	Yield
Crop	3	Corn	Yield

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201600101202**	**Study Area**	**No-Till**	Area (ha)	0.26	Tillage	No-till	Cover Crop	Barley
Practice ID	2	Practice Name	No-Till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCY-NT-CO-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Manor loam (coarse loamy, micaceous, mesic Typic Dystrochrept)								
Fertilizer	Dry fertilizer, not incorporated into the soil.								
Comments									

Crop	4	Corn	Yield
Crop	5	Corn	Yield
Crop	6	Corn	Yield

Test Site ID	Test Site Name
2016001004	**Bjorneberg et al. 1998**

Location		Floyd	IA	US
Study Citation	1998			
	Bjorneberg, D.L., Karlen, D.L., Kanwar, R.S., Cambardella, C. A.			
	Alternative N Fertilizer Management Strategies Effects on Subsurface Drain Effluent and N Uptake			
	Applied Engineering in Agriculture			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Eastern Iowa and Minnesota Till Prairies			
HUC_10	0708020112	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
Crops	Corn-Soybean			
Study Duration	3 years			

Summary

The authors' project objectives within this program were to quantify the effects of split- and single-N fertilization strategies on NO3-N concentration and loss in subsurface drain effluent and N accumulation and yield of corn (Zea mays L.) and soybean [Glycine max (L.) Merr.]. The study was conducted on glacial till derived soils in northeast Iowa from 1993 through 1995 using no-till and chisel plow tillage treatments. One-third of the 2,611 effluent samples had NO3-N concentrations greater than 10 mg L–1. Split applying fertilizer N based on pre-sidedress soil nitrate test (PSNT) results significantly increased corn yield for both tillage treatments in the extremely wet 1993 without increasing NO3-N loss in drain effluent. Increased grain yield also resulted in significantly more N removal. When fertilizer N was applied based on the PSNT, no-till and chisel treatments had similar NO3-N losses and concentrations. Average flow-weighted NO3-N concentrations in drain effluent were not increased when larger amounts of fertilizer were applied based on PSNT. However, prior crop and tillage practices and differences in drain flow volume caused significant differences in NO3-N losses and concentrations. These results suggest that spatial differences in flow volume are a major factor determining NO3-N loss in drainage effluent. Significant differences suggest that combining no-tillage practices with split N fertilizer management strategies can have positive environmental benefits without reducing corn yield.

Study ID	**201600100401**	**Study Area**	**No Till - PSNT**	Area (ha)	0.39	Tillage	No-tillage	Cover Crop	
Practice ID	1	Practice Name	No Till - PSNT	General Practice	Nutrient Management, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-CS-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Soils at the site are Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls), Kenyon loam (fine-loamy, mixed, mesic Typic Hapludolls) and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls)								
Fertilizer									
Comments									

Crop	1	Soybean	Yield	2.56	Mg/ha
Crop	5	Corn	Yield	6.5	Mg/ha
Crop	9	Soybean	Yield	3.12	Mg/ha

Crop	13	Corn		Yield	7.27	Mg/ha			
Crop	17	Soybean		Yield	2.85	Mg/ha			
Crop	21	Corn		Yield	4.86	Mg/ha			
Study ID	**201600100402**	**Study Area**	**No Till - ppN**	Area (ha)	0.39	Tillage	No-tillage	Cover Crop	
Practice ID	2	Practice Name	No Till - ppN	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-NT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Soils at the site are Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls), Kenyon loam (fine-loamy, mixed, mesic Typic Hapludolls) and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls)								
Fertilizer									
Comments									
Crop	2	Soybean		Yield	2.66	Mg/ha			
Crop	6	Corn		Yield	4.11	Mg/ha			
Crop	10	Soybean		Yield	3.47	Mg/ha			
Crop	14	Corn		Yield	6.33	Mg/ha			
Crop	18	Soybean		Yield	290	Mg/ha			
Crop	22	Corn		Yield	4.51	Mg/ha			
Study ID	**201600100403**	**Study Area**	**Chisel - PSNT**	Area (ha)	0.39	Tillage	Chisel plow	Cover Crop	
Practice ID	3	Practice Name	Chisel - PSNT	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NM-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Soils at the site are Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls), Kenyon loam (fine-loamy, mixed, mesic Typic Hapludolls) and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls)								
Fertilizer									
Comments									
Crop	3	Soybean		Yield	2.66	Mg/ha			
Crop	7	Corn		Yield	6.74	Mg/ha			
Crop	11	Soybean		Yield	3.17	Mg/ha			

Crop	15	Corn	Yield	8.16	Mg/ha
Crop	19	Soybean	Yield	2.87	Mg/ha
Crop	23	Corn	Yield	5.21	Mg/ha

Study ID	**201600100404**	**Study Area**	**Chisel - ppN**	Area (ha)	0.39	Tillage	Chisel plow	Cover Crop	
Practice ID	4	Practice Name	Chisel - ppN	General Practice		Control		Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Soils at the site are Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls), Kenyon loam (fine-loamy, mixed, mesic Typic Hapludolls) and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls)								
Fertilizer									
Comments									

Crop	4	Soybean	Yield	2.64	Mg/ha
Crop	8	Corn	Yield	4.91	Mg/ha
Crop	12	Soybean	Yield	3.59	Mg/ha
Crop	16	Corn	Yield	7.95	Mg/ha
Crop	20	Soybean	Yield	2.91	Mg/ha
Crop	24	Corn	Yield	5.18	Mg/ha

Test Site ID	Test Site Name
2016002004	Blevins et al.1990

Location		Fayette	KY	US
Study Citation	1990			
	Blevins, R. L., Frye, W. W., Baldwin, P. L., Robertson, S. D.			
	Tillage effects on sediment and soluble nutrient losses from a maury silt loam soil			
	Journal of Environmental Quality			
NRCS LRR	East and Central Farming and Forest Region			
NRCS MLRA	Kentucky Bluegrass			
HUC_10	0510020507	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	All treatments were replicated three times for a total of nine plots. Total volumes and loads are reported, therefore only 3 study areas shown.			
Crops	corn			
Study Duration	4 years			

Summary

This study compared the contributions of three tillage systems used in corn (Zea mays L.) production with (i) sediment losses and surface runoff and (ii) the potential for nonpoint-source surface water pollution from N and P fertilizers and triazine herbicides. Tillage treatments were no-tillage, chisel-plow tillage, and conventional tillage (moldboard plow plus secondary tillage). Over the 4-yr period, conventional tillage runoff volume was 576.7 kL/ha, chisel-plow 205.7 kL/ha, and no-tillage 239.9 kL/ha. Total soil loss from conventional tillage was 19.79 Mg/ha, chisel plow 0.71 Mg/ha, and no-tillage 0.55 Mg/ha. Amounts of NO3-, soluble P, and atrazine leaving the plots in surface runoff were greatest from conventional tillage and about equal from chisel-plow and no-tillage. The magnitudes of the losses in surface runoff water were small for all chemicals measured.

Study ID	201600200401	Study Area	Conventional	Area (ha)	0.06	Tillage	Conventional (moldboard plow plus secondary tillage)	Cover Crop	
Practice ID	1	Practice Name	Conventional	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Maury silt loam (fine, mixed, mesic, Typic Paleudalfs), average slope of 9%.								
Fertilizer									
Comments									

Crop	1	Corn	Yield	2.01	MG/acre
Crop	4	Corn	Yield	3.18	MG/acre
Crop	7	Corn	Yield	1.4	MG/acre
Crop	10	Corn	Yield	1.45	MG/acre

Study ID	**201600200402**	**Study Area**	**Chisel plow**	Area (ha)	0.06	Tillage	Chisel Plow	Cover Crop	
Practice ID	2	Practice Name	Chisel plow	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CT-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Maury silt loam (fine, mixed, mesic, Typic Paleudalfs), average slope of 9%.								
Fertilizer									
Comments									

Crop	2	Corn	Yield	2.17	MG/acre
Crop	5	Corn	Yield	3.21	MG/acre
Crop	8	Corn	Yield	1.19	MG/acre
Crop	11	Corn	Yield	1.3	MG/acre

Study ID	**201600200403**	**Study Area**	**No-tillage**	Area (ha)	0.06	Tillage	No-Till	Cover Crop	
Practice ID	3	Practice Name	No-tillage	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-NT-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Maury silt loam (fine, mixed, mesic, Typic Paleudalfs), average slope of 9%.								
Fertilizer									
Comments									

Crop	3	Corn	Yield	1.7	MG/acre
Crop	6	Corn	Yield	3.38	MG/acre
Crop	9	Corn	Yield	1.42	MG/acre
Crop	12	Corn	Yield	1.38	MG/acre

Test Site ID	Test Site Name
2013005035	**Brandi-Dohrn, F. M., 1997**
Location	Aurora, Marion, OR, US
Study Citation	1997
	Brandi-Dohrn, F. M., R. P. Dick, M. Hess, S. M. Kauffman, D. D. Hemphill, Jr. and J. S. Selker.
	Nitrate leaching under a cereal rye cover crop
	J. Environ. Qual. 26:181-188.
NRCS LRR	Northwestern Forest, Forage, and Specialty Crop Region
NRCS MLRA	Northern Pacific Coast Range, Foothills, and Valleys
HUC_10	1709000905 Test Site Scale Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication
	plot study: complete randomized block
Crops	Corn, rye, broccoli, fallow, winter wheat
Study Duration	3 years

Summary

The objective of this study was to compare winter NO3-N leaching losses under winter-fallow and a winter cereal rye (Seeale cereale L.) cover crop following the harvest of sweet corn (Zea mays L.) or broccoli (Brassica oleracea var. italic Plenck). Leachate was sampled with passive capillary wick samplers that apply a suction of 0 to 5 kPa to the soil-pore water and intercept leachate in a pan of known area. Without disturbing the over-laying soil profile, 32 samplers (0.26 z) were installed at a depth of 1.2m in a Willamette loam (fine-silty mixed mesic Pachic Ultic Argixeroll). The randomized complete-block split plot design of this cover crop-crop rotation study (initiated in 1989) has cropping system (winter fallow vs. winter cereal rye) as main plots and three N application rates, ranging from 0 to 280 kg N ha-1yr-1, as subplots. At the recommended N rate for the summer crops, NO3 leaching losses were 48 kg N ha-1 under sweet corn-winter-fallow for winter 1992-1993, 55 kg N ha-1 under broccoli-winter-fallow for winter 1993-1994, and 103 kg N ha-1 under sweet corn-winter-fallow for winter 1994-1995, which were reduced to 32, 21, and 69 kg N ha-1, respectively, under winter cereal rye. For the first two winters, most of the variation (61%) in NO3- leaching was explained by N rate (29%), cereal rye uptake (17%), and volume of leachate (15%). Seasonal, flow-weighted concentrations at the recommended N rate were 13.4 mg N L-1 under sweet corn-winter-fallow (1992-1993), 21.9 mg N L-1 under broccoli-winter- fallow, and 17.8 mg N L-1 under sweet corn-winter-fallow (1994-1995), which were reduced by 39, 58, and 22%, respectively, under winter cereal rye.

Study ID	**201300503501**	**Study Area**	**N0 - No Cover Crop**	Area (ha)	0.90	Tillage	Conventional	Cover Crop	None
Practice ID	1	Practice Name	N0-Fallow	General Practice	Control			Area Type	C
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	Loam/Silt Loam, Loam/Clay Loam, Loam								
Fertilizer	Three N application rates, ranging from 0 to 280 kg N ha/yr applied to subplots.								
Comments	Vadose zone water flux was sampled with custom-made passive capillary wick samplers (PCAPS) that apply a tension to the soil-water via a fiberglass wick and intercept a known area of flow by a pan. The PCAPS were installed from trenches dug with a backhoe, where tunnels perpendicular to the trenches, so that the tunnel roof was at a depth of 1.2 m below the surface, the depth at which solution samples were collected. Using a vacuum pump, samples were extracted from the glass jars in the PCAPS via high density polyethylene access tubing into 2000-mL graduated cylinders on the surface. Samples were taken after 2 cm of cumulative precipitation. For the critical leaching time, November through May, samples were taken on average every 10.6 days. Cropping system (winter cover crop or summer vegetable crop) and N application rate (zero, medium and recommended rates of N fertilizer) were the study variables.								

Crop	1	Fallow	Yield	-999999
Crop	7	Sweet Corn, Fallow	Yield	-999999
Crop	13	Broccoli, Winter Wheat	Yield	-999999
Crop	19	Winter Wheat, Fallow	Yield	-999999
Crop	25	Broccoli, Fallow	Yield	-999999
Crop	31	Sweet Corn, Fallow	Yield	-999999
Crop	37	Broccoli	Yield	-999999

Study ID	**201300503502**	**Study Area**	**N0 - Cereal Rye Cover Crop**	Area (ha)	0.90	Tillage	Conventional	Cover Crop	Cereal Rye
Practice ID	2	Practice Name	N0-Cover	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview	NC-CCY-CN-CEX-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	Loam/Silt Loam, Loam/Clay Loam, Loam								
Fertilizer	Three N application rates, ranging from 0 to 280 kg N ha/yr applied to subplots.								
Comments	Winter Cereal Rye. Cropping system (winter cover crop or summer vegetable crop) and N application rate (zero, medium and recommended rates of N fertilizer) were the study variables.								

Crop	2	Cereal Rye	Yield	-999999
Crop	8	Sweet Corn, Cereal Rye	Yield	-999999

Crop	14	Broccoli, Cereal Rye	Yield	-999999
Crop	20	Sweet Corn, Cereal Rye	Yield	-999999
Crop	26	Broccoli, Cereal Rye	Yield	-999999
Crop	32	Sweet Corn, Cereal Rye	Yield	-999999
Crop	38	Broccoli	Yield	-999999

Study ID	**201300503503**	**Study Area**	**N1 - No Cover Crop**	Area (ha)	0.90	Tillage	Conventional	Cover Crop	None
Practice ID	3	Practice Name	N1-Fallow	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NM-CCN-CN-CEX-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	Loam/Silt Loam, Loam/Clay Loam, Loam								
Fertilizer	Three N application rates, ranging from 0 to 280 kg N ha/yr applied to subplots.								
Comments									

Crop	3	Fallow	Yield	-999999
Crop	9	Sweet Corn, Fallow	Yield	-999999
Crop	15	Broccoli, Winter Wheat	Yield	-999999
Crop	21	Winter Wheat, Fallow	Yield	-999999
Crop	27	Broccoli, Fallow	Yield	-999999
Crop	33	Sweet Corn, Fallow	Yield	-999999
Crop	39	Broccoli	Yield	-999999

Study ID	**201300503504**	**Study Area**	**N1 - Cereal Rye Cover Crop**	Area (ha)	0.90	Tillage	Conventional	Cover Crop	Cereal Rye
Practice ID	4	Practice Name	N1-Cover	General Practice		Cover Crop		Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NC-CCY-CN-CEX-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	Loam/Silt Loam, Loam/Clay Loam, Loam								
Fertilizer	Three N application rates, ranging from 0 to 280 kg N ha/yr applied to subplots.								
Comments	Winter Cereal Rye. Cropping system (winter cover crop or summer vegetable crop) and N application rate (zero, medium and recommended rates of N fertilizer) were the study variables.								

Crop	4	Cereal Rye	Yield	-999999

Crop	10	Sweet Corn, Cereal Rye	Yield	-999999
Crop	16	Broccoli, Cereal Rye	Yield	-999999
Crop	22	Sweet Corn, Cereal Rye	Yield	-999999
Crop	28	Broccoli, Cereal Rye	Yield	-999999
Crop	34	Sweet Corn, Cereal Rye	Yield	-999999
Crop	40	Broccoli	Yield	-999999

Study ID	**201300503505**	**Study Area**	**N2 - No Cover Crop**	Area (ha)	0.90	Tillage	Conventional	Cover Crop	None
Practice ID	5	Practice Name	N2-Fallow	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NM-CCN-CN-CEX-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	Loam/Silt Loam, Loam/Clay Loam, Loam								
Fertilizer	Three N application rates, ranging from 0 to 280 kg N ha/yr applied to subplots.								
Comments									

Crop	5	Fallow	Yield	-999999
Crop	11	Sweet Corn, Fallow	Yield	-999999
Crop	17	Broccoli, Winter Wheat	Yield	-999999
Crop	23	Winter Wheat, Fallow	Yield	-999999
Crop	29	Broccoli, Fallow	Yield	-999999
Crop	35	Sweet Corn, Fallow	Yield	-999999
Crop	41	Broccoli	Yield	-999999

Study ID	**201300503506**	**Study Area**	**N2 - Cereal Rye Cover Crop**	Area (ha)	0.90	Tillage	Conventional	Cover Crop	Cereal Rye
Practice ID	6	Practice Name	N2-Cover	General Practice		Cover Crop		Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NC-CCY-CN-CEX-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	Loam/Silt Loam, Loam/Clay Loam, Loam								
Fertilizer	Three N application rates, ranging from 0 to 280 kg N ha/yr applied to subplots.								
Comments	Winter Cereal Rye. Cropping system (winter cover crop or summer vegetable crop) and N application rate (zero, medium and recommended rates of N fertilizer) were the study variables.								

Crop	6	Cereal Rye	Yield	-999999
Crop	12	Sweet Corn, Cereal Rye	Yield	-999999
Crop	18	Broccoli, Cereal Rye	Yield	-999999
Crop	24	Sweet Corn, Cereal Rye	Yield	-999999
Crop	30	Broccoli, Cereal Rye	Yield	-999999
Crop	36	Sweet Corn, Cereal Rye	Yield	-999999
Crop	42	Broccoli	Yield	-999999

Test Site ID	Test Site Name
2016001013	**Braun et al. 2016 - CHA**

Location		Chittenden	VT	US
Study Citation	2016			
	Braun, D., Meals, D., Moore, J., Macrellis, A.			
	Agricultural Practice Monitoring and Evaluation: Year 4 Report			
	Stone Environmental Inc.			
NRCS LRR	Northeastern Forage and Forest Region			
NRCS MLRA	St. Lawrence-Champlain Plain			
HUC_10	0201000808	Test Site Scale	Field	
Experimental Design Type/ Description	Before-After (Control-Test, Temporal)			
	paired-watershed design			
Crops	Corn			
Study Duration	1 year			

Summary

The goal of the monitoring program is to quantify the treatment effect of specific conservation practices, in this case a grassed waterway, in reducing runoff losses of sediment and nutrients – especially phosphorus (P) – from agricultural fields in corn and hay production in the Lake Champlain Basin.

Study ID	**201600101301**	**Study Area**	**CHAControl**	Area (ha)	2.02	Tillage	tandem disk to 6 inches	Cover Crop	
Practice ID	1	Practice Name	CHAControl	General Practice	Control			Area Type	C
Category	Management	Study Focus	Grassed Waterway	Practice Overview	NC-CCY-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Covington silty clay, Cv: 87.1%Vergennes clay, VeB: 12.9%								
Fertilizer	Manure and commercial fertilizer broadcast and incorporated in three application May, July and October.								
Comments									

Crop	2	Corn	Yield

Study ID	**201600101302**	**Study Area**	**CHATest**	Area (ha)	1.78	Tillage	tandem disk to 6 inches	Cover Crop	
Practice ID	2	Practice Name	CHATest	General Practice	Grassed Waterway			Area Type	T
Category	Structural	Study Focus	Grassed Waterway	Practice Overview	NC-CCY-CT-CO-EG				
Irrigation	No	Irrig. Descrip.							
Soils	Vergennes clay, VeB: 73.5%Covington silty clay, Cv: 26.5%								
Fertilizer	Manure and commercial fertilizer broadcast and incorporated in three application May, July and October.								
Comments									

Crop	1	Corn	Yield

Test Site ID	Test Site Name
2016001007	**Braun et al. 2016 - FRA**

Location		Franklin	VT	US
Study Citation	2016			
	Braun, D., Meals, D., Moore, J., Macrellis, A.			
	Agricultural Practice Monitoring and Evaluation: Year 4 Report			
	Stone Environmental Inc.			
NRCS LRR	Northeastern Forage and Forest Region			
NRCS MLRA	St. Lawrence-Champlain Plain			
HUC_10	0201000811	Test Site Scale	Field	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	paired-watershed design			
Crops	Corn			
Study Duration				

Summary

The goal of the monitoring program is to quantify the treatment effect of a specific conservation practice, in this case, reduced tillage with manure injection and a water and sediment control basin (WASCoB), in reducing runoff losses of sediment and nutrients – especially phosphorus (P) – from agricultural fields in corn and hay production in the Lake Champlain Basin.

Study ID	**201600100701**	**Study Area**	**FRATest**	Area (ha)	6.31	Tillage	reduced tillage, vertical tillage, vetical tillage	Cover Crop	Ryegrass
Practice ID	1	Practice Name	FRATest	General Practice	Grassed Waterway			Area Type	T
Category	Structural	Study Focus	Tillage, Fertilizer, WASCOB	Practice Overview	NM-CCY-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Munson silt loam, MuC: 11%Scantic silt loam, ScA: 19.4%Belgrade silt loam, BeC: 14.8%Georgia stony loam, GeB: 20.7%St. Albans silty loam, SaB: 7.9%Massena stony loam, MeA: 26.1%								
Fertilizer	Manure injection and band application								
Comments									

Crop	1	Corn	Yield
Crop	2	Hay	Yield
Crop	3	Grass	Yield
Crop	7	Corn	Yield
Crop	8	Hay	Yield

Crop	11	Corn		Yield					
Crop	12	Hay		Yield					
Crop	15	Corn		Yield					
Study ID	**201600100702**	**Study Area**	**FRAControl**	Area (ha)	5.42	Tillage	chisel plow, conventional tillage	Cover Crop	
Practice ID	2	Practice Name	FRAControl	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage, Fertilizer, WASCOB	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Munson silt loam, MuC: 3.8%Scantic silt loam, ScA: 23.8%Belgrade silt loam, BeC: 6.4%Georgia stony loam, GeB: 4.9%St. Albans silty loam, SaB: 3.1%Massena stony loam, MeA: 8.8%Munson silt loam, MuB: 41%Lordstown-Rock outcrop complex, LrC: 7.9%								
Fertilizer									
Comments									
Crop	4	Corn		Yield					
Crop	5	Hay		Yield					
Crop	6	Grass		Yield					
Crop	9	Corn		Yield					
Crop	10	Hay		Yield					
Crop	13	Corn		Yield					
Crop	14	Hay		Yield					
Crop	16	Corn		Yield					
Study ID	**201600100703**	**Study Area**	**FRAWASCoB**	Area (ha)	9.19	Tillage	Reduced tillage (FRA)	Cover Crop	
Practice ID	3	Practice Name	FRAWASCoB	General Practice		Water and Sediment Control Basin/Pond		Area Type	T
Category	Structural	Study Focus	Tillage, Fertilizer, WASCOB	Practice Overview		NC-CCN-CT-CO-EW			
Irrigation	No	Irrig. Descrip.							
Soils	Raynam (60%) and Binghamville (40%) silt loams, which are classified as moderately runoff prone (hydrologic soil group C).								
Fertilizer									
Comments									
Crop	17	Corn		Yield					
Crop	18	Corn		Yield					

Test Site ID	Test Site Name
2016001015	**Braun et al. 2016 - PAW**

Location		Rutland	VT	US
Study Citation	2016		
	Braun, D., Meals, D., Moore, J., Macrellis, A.		
	Agricultural Practice Monitoring and Evaluation: Year 4 Report		
	Stone Environmental Inc.		
NRCS LRR	Northeastern Forage and Forest Region		
NRCS MLRA	St. Lawrence-Champlain Plain		
HUC_10	0201000102	Test Site Scale	Field
Experimental Design Type/ Description	Before-After (Control-Test, Temporal)		
	paired-watershed design		
Crops	Corn		
Study Duration	4		

Summary

The goal of the monitoring program is to quantify the treatment effect of conservation practices, specifically cover cropping, in reducing runoff losses of sediment and nutrients – especially phosphorus (P) – from agricultural fields in corn and hay production in the Lake Champlain Basin.

Study ID	**201600101501**	**Study Area**	**PAWTest**	Area (ha)	2.43	Tillage	Chisel plow, disc harrow	Cover Crop	Winter Rye
Practice ID	1	Practice Name	PAWControl	General Practice	Grassed Waterway			Area Type	C
Category	Structural	Study Focus	Cover Crop	Practice Overview	NC-CCY-CT-CO-EN				
Irrigation		Irrig. Descrip.							
Soils	Bomoseen and Pittstown soils, 148B: 62.9%Taconic-Macomber complex, 43C: 4.3%Bomoseen and Pittstown soils, 148C: 33.5%								
Fertilizer									
Comments									

Crop	1	Corn	Yield		tons/acre
Crop	3	Corn	Yield	7	tons/acre
Crop	5	Corn	Yield	18.5	tons/acre
Crop	7	Corn	Yield	11	tons/acre

Study ID	**201600101502**	**Study Area**	**PAWControl**	Area (ha)	1.25	Tillage	Chisel plow, disc harrow	Cover Crop	
Practice ID	2	Practice Name	PAWControl	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop	Practice Overview		NC-CCN-CT-CO-EN			
Irrigation		Irrig. Descrip.							
Soils	Taconic-Hubbardton-Macomber complex, 12F: 0.7%Raynham silt loam, 26A: 34.3%Macomber-Dutchess complex, 52B: 24.4%Bomoseen and Pittstown soils, 148C: 40.6%								
Fertilizer									
Comments									

Crop	2	Corn	Yield		tons/acre
Crop	4	Corn	Yield	7	tons/acre
Crop	6	Corn	Yield	4	tons/acre
Crop	8	Corn	Yield	4	tons/acre

Test Site ID	Test Site Name				Summary
2016001014	**Braun et al. 2016 - WIL**				The goal of the monitoring program is to quantify the treatment effect of conservation practices, specifically manure injection, in reducing runoff losses of sediment and nutrients – especially phosphorus (P) – from agricultural fields in corn and hay production in the Lake Champlain Basin.
Location		Chittenden	VT	US	
Study Citation	2016				
	Braun, D., Meals, D., Moore, J., Macrellis, A.				
	Agricultural Practice Monitoring and Evaluation: Year 4 Report				
	Stone Environmental Inc.				
NRCS LRR	Northeastern Forage and Forest Region				
NRCS MLRA	St. Lawrence-Champlain Plain				
HUC_10	0201000307	Test Site Scale	Field		
Experimental Design Type/ Description	Before-After (Control-Test, Temporal)				
	paired-watershed design				
Crops	Corn				
Study Duration	4 Years				

Study ID	**201600101401**	**Study Area**	**WILTest**	Area (ha)	1.70	Tillage	Disc chisel, Sunflower finishing harrow;5-95% res. after harvest	Cover Crop	Ryegrass
Practice ID	1	Practice Name	WILTest	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCY-CT-CO-EN				
Irrigation		Irrig. Descrip.							
Soils	Limerick silt loam, Le: 85.9%Hadley very fine sandy loam, Hf: 7%Winooski very fine sandy loam, Wo: 7%								
Fertilizer									
Comments									

Crop	1	Corn	Yield	6	tons/acre
Crop	3	Corn	Yield	16	tons/acre
Crop	5	Corn	Yield	18	tons/acre
Crop	7	Corn	Yield	16	tons/acre

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201600101402**	**Study Area**	**WILControl**	Area (ha)	0.81	Tillage	Disc chisel, Sunflower finishing harrow;5-95% res. after harvest	Cover Crop	Ryegrass
Practice ID	2	Practice Name	WILControl	General Practice	Control			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCY-CT-CO-EN				
Irrigation		Irrig. Descrip.							
Soils	Limerick silt loam, Le: 34.6%Winooski very fine sandy loam, Wo: 65.3%								
Fertilizer									
Comments									

Crop	2	Corn	Yield	6	tons/acre
Crop	4	Corn	Yield	16	tons/acre
Crop	6	Corn	Yield	18	tons/acre
Crop	8	Corn	Yield	18	tons/acre

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2016001005	**Bundy et al. 2001**

Location		ColumbiaDane	WI	US

Study Citation	2001
	Bundy, L.G, Andraski, T.W., Powell, J.M.
	Management Practice Effects on Phosphorus Losses in Runoff in Corn Production Systems
	Journal of Environmental Quality
NRCS LRR	Lake State Fruit, Truck Crop, and Dairy Region
NRCS MLRA	Southern Wisconsin and Northern Illinois Drift Plain
HUC_10	0709000205
Test Site Scale	Plot
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)
	Randomized complete block design using a plot arrangement with four replications (tillage site).
Crops	Corn
Study Duration	1 year

Summary

Field experiments in corn (Zea mays L.) production systems with treatments including differing soil test P levels, tillage and manure application combinations, and manure and biosolids application histories were used to assess management practice effects on P losses. Runoff from simulated rainfall (76 mm/h) was collected from 0.83-m^2 areas for 1 h after rainfall initiation and analyzed for dissolved reactive P (DRP), bioavailable P, total P (TP), and sediment. In no-till corn, both DRP concentration and load increased as Bray P1 soil test (STP) increased from 8 to 62 mg/kg. A 5-yr history of manure or biosolids application greatly increased STP and DRP concentrations in runoff. Studies of tillage and manure application effects on P losses showed that tillage to incorporate manure generally lowered runoff DRP concentration but increased TP concentration and loads due to increased sediment loss.

Study ID	**201600100501**	**Study Area**	**Inorg_NT_No**	Area (ha)	0.02	Tillage	No Till	Cover Crop	
Practice ID	1	Practice Name	Inorg_NT_No	General Practice	Nutrient Management, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer	No fertilizer.								
Comments									

Crop 1 Corn Yield

Study ID	**201600100502**	**Study Area**	**Inorg_IPF_L**	Area (ha)	0.02	Tillage	No Till	Cover Crop	
Practice ID	2	Practice Name	Inorg_IPF_L	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NM-CCN-NT-CO-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer									
Comments									

Crop 2 Corn Yield

Study ID	**201600100503**	**Study Area**	**Inorg_IPF_H**	Area (ha)	0.02	Tillage	No Till	Cover Crop	
Practice ID	3	Practice Name	Inorg_IPF_H	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-NT-CO-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer									
Comments									

Crop 3 Corn Yield

Study ID	**201600100504**	**Study Area**	**Org_CP_No**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	
Practice ID	4	Practice Name	Org_CP_No	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NF-CCN-CT-CO-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer	No fertilizer.								
Comments									

Crop 4 Corn Yield

Study ID	**201600100505**	**Study Area**	**Org_CP_2YBio**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	
Practice ID	5	Practice Name	Org_CP_2YBio	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer									
Comments									

Crop 5 Corn Yield

Study ID	**201600100506**	**Study Area**	**Org_CP_5YBio**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	
Practice ID	6	Practice Name	Org_CP_5YBio	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer									
Comments									

Crop 6 Corn Yield

Study ID	**201600100507**	**Study Area**	**Org_CP_5YMan**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	
Practice ID	7	Practice Name	Org_CP_5YMan	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	silt loam soils (fine-silty, mixed, mesic Typic Argiudolls)								
Fertilizer									
Comments									

Crop 7 Corn Yield

Study ID	**201600100508**	**Study Area**	**Till_CP_No**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	
Practice ID	8	Practice Name	Till_CP_No	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils									
Fertilizer	No fertilizer.								
Comments									

Crop 8 Corn Yield

Study ID	**201600100509**	**Study Area**	**Till_ST_No**	Area (ha)	0.00	Tillage	Shallow Till	Cover Crop	
Practice ID	9	Practice Name	Till_ST_No	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils									
Fertilizer									
Comments									

Crop 9 Corn Yield

Study ID	**201600100510**	**Study Area**	**Till_NT_No**	Area (ha)	0.00	Tillage	No Till	Cover Crop	
Practice ID	10	Practice Name	Till_NT_No	General Practice	Nutrient Management, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils									
Fertilizer	No fertilizer.								
Comments									

Crop 10 Corn Yield

Study ID	**201600100511**	**Study Area**	**Till_CP_1YMan**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	
Practice ID	11	Practice Name	Till_CP_1YMan	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils									
Fertilizer									
Comments									

Crop 11 Corn Yield

Study ID	**201600100512**	**Study Area**	**Till_ST_1YMan**	Area (ha)	0.00	Tillage	Shallow Till	Cover Crop	
Practice ID	12	Practice Name	Till_ST_1YMan	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils									
Fertilizer									
Comments									

Crop 12 Corn Yield

Study ID	**201600100513**	**Study Area**	**Till_NT_1YMan**	Area (ha)	0.00	Tillage	No Till	Cover Crop	
Practice ID	13	Practice Name	Till_NT_1YMan	General Practice	Nutrient Management, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils									
Fertilizer									
Comments									

Crop 13 Corn Yield

Test Site ID	Test Site Name
2013007054	Chichester et al. 1992

Location	Riesel	McLennan	TX	US
Study Citation	1992			
	Chichester, F.W., and C. W. Richardson.			
	Sediment and Nutrient Loss from Clay Soils as Affected by Tillage			
	J. Environ. Qual. 21(4): 587-590			
NRCS LRR	Southwestern Prairies Cotton and Forage Region			
NRCS MLRA	Texas Blackland Prairie, Southern Part			
HUC_10	1207010101	Test Site Scale	Field	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	A conventional tillage (CT) system was used on three watersheds, and a no-till (NT) system was used on the other three watersheds.			
Crops	Corn, Wheat, Sorghum			
Study Duration	6 years			

Summary

This study was designed to compare the effect of no-till (NT) and conventional chisel-till (CT) soil management on runoff water volumes, sediment loss, and N and P loss from small watersheds on a clay soil. Three NT and three CT watersheds located on Houston Black clay vertisol soil (fine, montmorillonitic, thermic, Udic Pellusterts) in east central Texas were used for the study. Wheat (Triticum aestivum L.), corn (Zea mays L.) and sorghum [Sorghum bicolor (L.) Moench] were grown rotationally on the watersheds from 1984 to 1989. Runoff amounts, sediment loss, and N and P losses were measured for each rainfall event that produced runoff. Runoff volume was not changed by tillage system and sediment loss and N and P losses in runoff were less, on average, from NT than from CT. Runoff averaged 1 .3 ML ha-1 annually for both CT and NT. Average annual quantities for sediment and nutrient losses were: 160 kg/ha and 1575 kg ha-1 for sediment, 3.8 kg ha-1 and 8.1 kg ha-1 for N, and 0.8 kg ha-1 and 1.5 kg ha-1 for P for NT and CT, respectively. These results indicate that the loss of sediment and nutrients from agricultural lands could be minimized by using NT on clay soils.

Study ID	201300705401	Study Area	W13	Area (ha)	4.60	Tillage	Conventional	Cover Crop	Not specified
Practice ID	1	Practice Name	W13 WW T CF	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CN-CEX-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Fertilizer was applied in solution with 112 kg/ha of 10-15-0 (N-P-K) being applied as starter at planting, and the bulk of N and P side-dress dribbled as 24-3-0 (N-P-K) about 30 d after planting.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn	Yield	6121	kg/ha
Crop	2	Wheat	Yield	3687	kg/ha
Crop	3	Sorghum	Yield	6334	kg/ha
Crop	4	Corn	Yield	6308	kg/ha
Crop	5	Wheat	Yield	3322	kg/ha

Crop	6	Sorghum		Yield	5826	kg/ha			
Study ID	**201300705402**	**Study Area**	**Y6**	Area (ha)	6.60	Tillage	No Till	Cover Crop	Not specified
Practice ID	2	Practice Name	Y6 No Till	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-NT-CEX-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Fertilizer was applied in solution with 112 kg/ha of 10-15-0 (N-P-K) being applied as starter at planting, and the bulk of N and P side-dress dribbled as 24-3-0 (N-P-K) about 30 d after planting.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: No Till, Waterway, Terrace, Contour Farming.								
Crop	1	Corn		Yield	2893	kg/ha			
Crop	2	Wheat		Yield	3212	kg/ha			
Crop	3	Sorghum		Yield	5103	kg/ha			
Crop	4	Corn		Yield	3713	kg/ha			
Crop	5	Wheat		Yield	2022	kg/ha			
Crop	6	Sorghum		Yield	2483	kg/ha			
Study ID	**201300705403**	**Study Area**	**Y8**	Area (ha)	8.40	Tillage	No Till	Cover Crop	Not specified
Practice ID	3	Practice Name	Y8 No Till	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-NT-CEX-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Fertilizer was applied in solution with 112 kg/ha of 10-15-0 (N-P-K) being applied as starter at planting, and the bulk of N and P side-dress dribbled as 24-3-0 (N-P-K) about 30 d after planting.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: No Till, Waterway, Terrace, Contour Farming.								
Crop	1	Corn		Yield	4758	kg/ha			
Crop	2	Wheat		Yield	3005	kg/ha			
Crop	3	Sorghum		Yield	2748	kg/ha			
Crop	4	Corn		Yield	5187	kg/ha			
Crop	5	Wheat		Yield	1363	kg/ha			

Crop	6	Sorghum		Yield	1532	kg/ha			
Study ID	**201300705404**	**Study Area**	**Y10**	Area (ha)	7.50	Tillage	No Till	Cover Crop	Not specified
Practice ID	4	Practice Name	Y10 No Till	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-NT-CEX-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Fertilizer was applied in solution with 112 kg/ha of 10-15-0 (N-P-K) being applied as starter at planting, and the bulk of N and P side-dress dribbled as 24-3-0 (N-P-K) about 30 d after planting.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: No Till, Waterway, Terrace, Contour Farming.								
Crop	1	Corn		Yield	4014	kg/ha			
Crop	2	Wheat		Yield	2250	kg/ha			
Crop	3	Sorghum		Yield	3529	kg/ha			
Crop	4	Sorghum		Yield	4427	kg/ha			
Crop	5	Wheat		Yield	-999999	kg/ha			
Crop	6	Sorghum		Yield	2632	kg/ha			
Study ID	**201300705405**	**Study Area**	**Y13**	Area (ha)	4.60	Tillage	Conventional	Cover Crop	Not specified
Practice ID	5	Practice Name	Y13 WW T CF	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CN-CEX-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Fertilizer was applied in solution with 112 kg/ha of 10-15-0 (N-P-K) being applied as starter at planting, and the bulk of N and P side-dress dribbled as 24-3-0 (N-P-K) about 30 d after planting.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								
Crop	1	Corn		Yield	4397	kg/ha			
Crop	2	Wheat		Yield	2670	kg/ha			
Crop	3	Sorghum		Yield	3836	kg/ha			
Crop	4	Sorghum		Yield	6455	kg/ha			
Crop	5	Wheat		Yield	190	kg/ha			

Crop	6	Sorghum		Yield	6418	kg/ha			
Study ID	**201300705406**	**Study Area**	**W12**	Area (ha)	4.00	Tillage	Conventional	Cover Crop	Not specified
Practice ID	6	Practice Name	W12 WW T CF	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CN-CEX-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Fertilizer was applied in solution with 112 kg/ha of 10-15-0 (N-P-K) being applied as starter at planting, and the bulk of N and P side-dress dribbled as 24-3-0 (N-P-K) about 30 d after planting.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								
Crop	1	Corn		Yield	4794	kg/ha			
Crop	2	Wheat		Yield	3389	kg/ha			
Crop	3	Sorghum		Yield	4717	kg/ha			
Crop	4	Corn		Yield	7288	kg/ha			
Crop	5	Wheat		Yield	1735	kg/ha			
Crop	6	Sorghum		Yield	5643	kg/ha			

Test Site ID	Test Site Name
2016002009	**Culley et al., 1983**

Location		Ontario	ZZ	CA
Study Citation	1983			
	Culley, J. L. B., Bolton, E. F., Bernyk, V.			
	Suspended solids and phosphorus loads from a clay soil: 1. Plot studies			
	Journal of Environmental Quality			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
Crops	Continuous corn, continuous bluegrass sod, and corn-oat-alfalfa-alfalfa			
Study Duration	2 years			

Summary

Phosphorus and suspended solids (SS) contents in tile discharge from two southwestern Ontario clay soil experiments were measured over a 2-y period. Crop cover, P fertilization rate, and tile drain depth were found to significantly affect dissolved P export. Dissolved P concentrations in effluent from permanent bluegrass sod exceeded those from continuous corn and rotational plots. Subsurface sediment and sediment-associated P loads were highest from continuous corn. Greater soil cover over the tile line decreased both sediment and P concentrations. Sediment-associated P concentrations increased with P fertilization rate at one of the experimental locations.

Study ID	**201600200901**	**Study Area**	**Continuous Corn (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	1	Practice Name	Continuous Corn (Fertilized)	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	N-P-K fertilizer at about recommended rates.								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 1 Corn Yield

Study ID	**201600200902**	**Study Area**	**Continuous Bluegrass Sod (Fertilized)**	Area (ha)	0.09	Tillage	No-till	Cover Crop	
Practice ID	2	Practice Name	Continuous Bluegrass Sod (Fertilized)	General Practice	Conservation Tillage			Area Type	C
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	N-P-K fertilizer at about recommended rates.								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 2 Bluegrass Sod Yield

Study ID	**201600200903**	**Study Area**	**Four Crop Rotation - Corn Year (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	3	Practice Name	Four Crop Rotation - Corn Year (Fertilized)	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	N-P-K fertilizer at about recommended rates.								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 3 Corn Yield

Study ID	**201600200904**	**Study Area**	**Four Crop Rotation - Oat Year (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	4	Practice Name	Four Crop Rotation - Oat Year (Fertilized)	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	N-P-K fertilizer at about recommended rates.								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 4 Oat Yield

Study ID	**201600200905**	**Study Area**	**Four Crop Rotation - Alfalfa Year 1 (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	5	Practice Name	Four Crop Rotation - Alfalfa Year 1 (Fertilized)	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	N-P-K fertilizer at about recommended rates.								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 5 Alfalfa Yield

Study ID	**201600200906**	**Study Area**	**Four Crop Rotation - Alfalfa Year 2 (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	6	Practice Name	Four Crop Rotation - Alfalfa Year 2 (Fertilized)	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	N-P-K fertilizer at about recommended rates.								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 6 Alfalfa Yield

Study ID	**201600200907**	**Study Area**	**Continuous Corn (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	7	Practice Name	Continuous Corn (Not-fertilized)	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NF-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	No fertilizer								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 7 Corn Yield

Study ID	**201600200908**	**Study Area**	**Continuous Bluegrass Sod (Not-fertilized)**	Area (ha)	0.09	Tillage	No-till	Cover Crop	
Practice ID	8	Practice Name	Continuous Bluegrass Sod (Not-fertilized)	General Practice	Conservation Tillage, Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NF-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	No fertilizer								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 8 Bluegrass Sod Yield

Study ID	**201600200909**	**Study Area**	**Four Crop Rotation - Corn Year (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	9	Practice Name	Four Crop Rotation - Corn Year (Not-fertilized)	General Practice	Crop Rotation, Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	No fertilizer								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 9 Corn Yield

Study ID	**201600200910**	**Study Area**	**Four Crop Rotation - Oat Year (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	10	Practice Name	Four Crop Rotation - Oat Year (Not-fertilized)	General Practice	Crop Rotation, Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	No fertilizer								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 10 Oat Yield

Study ID	**201600200911**	**Study Area**	**Four Crop Rotation - Alfalfa Year 1 (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	11	Practice Name	Four Crop Rotation - Alfalfa Year 1 (Not-fertilized)	General Practice	Crop Rotation, Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	No fertilizer								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 11 Alfalfa Yield

Study ID	**201600200912**	**Study Area**	**Four Crop Rotation - Alfalfa Year 2 (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	12	Practice Name	Four Crop Rotation - Alfalfa Year 2 (Not-fertilized)	General Practice	Crop Rotation, Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer	No fertilizer								
Comments	Experiment 1: Fertilizer application rates and type of crop rotation tested.								

Crop 12 Alfalfa Yield

Study ID	**201600200913**	**Study Area**	**Alfalfa Shallow Drain (High Fertilizer)**	Area (ha)	0.10	Tillage	Conventional	Cover Crop	
Practice ID	13	Practice Name	Alfalfa Shallow Drain (High Fertilizer)	General Practice	Control			Area Type	C
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer									
Comments	Experiment 2: Fertilizer application rates and depth to tile drain tested.								

Crop 13 Alfalfa Yield

Study ID	**201600200914**	**Study Area**	**Alfalfa Deep Drain (High Fertilizer)**	Area (ha)	0.10	Tillage	Conventional	Cover Crop	
Practice ID	14	Practice Name	Alfalfa Deep Drain (High Fertilizer)	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NC-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer									
Comments	Experiment 2: Fertilizer application rates and depth to tile drain tested.								

Crop 14 Alfalfa Yield

Study ID	**201600200915**	**Study Area**	**Alfalfa Shallow Drain (Low Fertilizer)**	Area (ha)	0.10	Tillage	Conventional	Cover Crop	
Practice ID	15	Practice Name	Alfalfa Shallow Drain (Low Fertilizer)	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NM-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer									
Comments	Experiment 2: Fertilizer application rates and depth to tile drain tested.								

Crop 15 Alfalfa Yield

Study ID	**201600200916**	**Study Area**	**Alfalfa Deep Drain (Low Fertilizer)**	Area (ha)	0.10	Tillage	Conventional	Cover Crop	
Practice ID	16	Practice Name	Alfalfa Deep Drain (Low Fertilizer)	General Practice	Drainage Water Management, Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer, Controlled Drainage, Crop Rotation	Practice Overview	NM-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston (Haplaquoll great group)								
Fertilizer									
Comments	Experiment 2: Fertilizer application rates and depth to tile drain tested.								

Crop	16	Alfalfa	Yield

Test Site ID	Test Site Name
2013001003	**Cypress Creek**

Location		Christian	IL	US

Study Citation	2006
	SCHOONOVER, Jon E.; KARL W. J. WILLIARD, JAMES J. ZACZEK, JEAN C. MANGUN and ANDREW D. CARVER
	AGRICULTURAL SEDIMENT REDUCTION BY GIANT CANE AND FOREST RIPARIAN BUFFERS
NRCS LRR	East and Central Farming and Forest Region
NRCS MLRA	Kentucky and Indiana Sandstone and Shale Hills and Valleys, Southern Par
HUC_10	0714010801 Test Site Scale Plot
Experimental Design Type/ Description	Multiple Treatments, No Control, With Replication
	Plot Study/No Control: The research objectives were to determine if both giant cane and mixed deciduous forest stands were effective filters of agricultural sediment in overland flow on an annual and seasonal basis and to assess whether the two riparian vegetation types differed significantly in their abilities to attenuate agricultural sediment.To achieve these objectives, 10m wide riparian plots in each vegetation type were monitored at 3.3m increments for sediment retention during significant storm events. The design resulted in two replicates in each vegetation type at each sampling distance (3.3 m) and the study was also replicated over time (i.e., individual rainfall events).
Crops	Corn, Soybeans
Study Duration	1 year

Summary

The sediment filtering capabilities of giant cane (Arundinaria gigantea (Walt.) Chapm.) and forest riparian buffers were compared in a southern Illinois, USA non tile drained agricultural watershed. Giant cane, a bamboo species, serves as important wildlife habitat throughout its native range in the southeastern and lower midwestern United States. Overland flow samples were collected at the field edge and at 3.3 m, 6.6 m, and 10.0m within the riparian buffers during 19 precipitation events over a 1-year period. On an annual basis, significant sediment reductions occurred by 3.3m and 6.6m in the cane and forest buffers, respectively. The giant cane buffer reduced incoming sediment mass by 94% within the first 3.3 m, while the forest buffer reduced sediment by 86% over 6.6 m. Within 10.0m of the field edge, the cane and forest buffers reduced sediment mass by 100% and 76%, respectively. On a seasonal basis, the cane buffer outperformed the forest buffer. During each of the four seasons, the cane buffer reduced sediment masses within 3.3m of the field edge, while the forest buffer showed initial reductions occurring at 6.6m during the summer, fall, and winter. No detectable reductions occurred during the spring in the forested buffer. Reductions in sediment concentrations were less evident compared to mass basis, indicating that infiltration may be a more important sediment reduction mechanism than particle settling. Both the forest and giant cane buffers had relatively high measured soil infiltration rates. Study results indicate that giant cane is an appropriate species to include in riparian buffer restoration designs for sediment control.

Study ID	**201300100301**	**Study Area**	**Agricultural Field A**	Area (ha)	0.13	Tillage	No Till	Cover Crop	Yellow Rocket,Barbarea vulgaris R. Br.
Practice ID	1	Practice Name	Giant Cane	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCY-NT-CS-EB				
Irrigation	NR	Irrig. Descrip.	not reported						
Soils	The riparian soils within the two cover types and the adjacent agricultural soils were classified as Haymond silt loam (Coarse-silty, mixed, nonacid, mesic Typic Udifluvent), and the underlying geology of the area was Ste. Genevieve (or Levias) and Warsaw								
Fertilizer	Fertilizers added during alternating corn years.								
Comments	Two overland flow collectors were placed at each of the four sampling locations (i.e., field edge or 0.0 m, 3.3 m, 6.6 m, and 10.0m from the field edge) in both of the riparian buffers (Figure 1). The design resulted in two replicates in each vegetation type at each sampling distance (3.3 m) and the study was also replicated over time (i.e., individual rainfall events). This arrangement allowed for calculation of percent sediment reduction at successive distances.								

Crop 1 corn (Zea mays L.)/ soybeans (Glycine m Yield -999999

Study ID	**201300100302**	**Study Area**	**Agricultural Field B**	Area (ha)	0.13	Tillage	No Till	Cover Crop	Yellow Rocket,Barbarea vulgaris R. Br.
Practice ID	2	Practice Name	Forest	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCY-NT-CS-EB				
Irrigation	NR	Irrig. Descrip.	not reported						
Soils	The riparian soils within the two cover types and the adjacent agricultural soils were classified as Haymond silt loam (Coarse-silty, mixed, nonacid, mesic Typic Udifluvent), and the underlying geology of the area was Ste. Genevieve (or Levias) and Warsaw								
Fertilizer	Fertilizers added during alternating corn years.								
Comments	Two overland flow collectors were placed at each of the four sampling locations (i.e., field edge or 0.0 m, 3.3 m, 6.6 m, and 10.0m from the field edge) in both of the riparian buffers (Figure 1). The design resulted in two replicates in each vegetation type at each sampling distance (3.3 m) and the study was also replicated over time (i.e., individual rainfall events). This arrangement allowed for calculation of percent sediment reduction at successive distances.								

Crop 2 corn (Zea mays L.)/ soybeans (Glycine m Yield -999999

Test Site ID	Test Site Name
2013007050	**Drury et al. 1993**

Location	Woodslee	Ontario	XX	CA

Study Citation	1993
	Drury, C.F., D.J. McKenney, W.I. Findlay, and J.D. Gaynor.
	Influence of Tillage on Nitrate Loss in Surface Runoff and Tile Drainage
	Soil Sci. Soc. Am. J. 57: 797-802.
NRCS LRR	Canada
NRCS MLRA	Canada
HUC_10	-999999
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	plot study: complete randomized block
Crops	Corn, Kentucky Bluegrass
Study Duration	3 years

Summary

A study was conducted to determine the effect of conservation (no-tillage [NT] and ridge tillage [RT]) and conventional (moldboard plow) tillage systems on NO3- loss through surface runoff and tile drainage. Nitrate concentrations and total volume of surface runoff and tile drainage from conventional tillage (CT), no-tillage (NT), and ridge tillage (RT) all planted in continuous corn (Zea mays L.), and Kentucky bluegrass (BG, Poa pratensis L.) treatments, were measured for 3 yr, 1989 to 1991. All corn tillage treatments received a total of 178.6 kg N ha-1 annually during the growing season. The volume of water drained through the tiles in the corn tillage systems always exceeded the volume in surface runoff, typically by factors of 2 to 4. Tile drainage was greatest from the CT treatments, least from BG, and approximately equal from RT and NT treatments in 1989 and 1990. Concentrations of NO3- in tile water from CT, RT, and NT treatments exceeded the maximum recommended safe limit for drinking water (10 mg N L-1) in 79% of the leaching events, with flow-weighted concentrations between 12 and 17 mg N L-1 in 1989 and 1990. Flow-weighted NO3- concentrations were only 1.2 and 2.6 mg N L-1 from BG in 1989 and 1990, respectively. The total NO3- lost in tile water in 1989 was 18, 14, 14, and 1 kg N ha-1 from the CT, RT, NT, and BG treatments, respectively, whereas in 1990 there were 29, 20, 20, and 3 kg N ha-1 lost from the CT, RT, NT, and BG treatments, respectively. Nitrate losses in surface runoff were lower than in tile drainage, with maximums of 2.6 kg N ha-1 for the RT and NT treatments in 1989 and 5.5 kg N ha-1 for the RT treatment in 1990. In 1989 and 1990, both RT and NT treatments had greater yields and N uptake in grain than the CT treatment. A serious drought in 1991 limited corn yield, N uptake in grain, and NO3- loss.

Study ID	**201300705001**	**Study Area**	**CT**	Area (ha)	0.10	Tillage	Conventional	Cover Crop	Not specified
Practice ID	1	Practice Name	CT Conv	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CN-CO-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay Loam- Brookston								
Fertilizer	All plots received 132 kg/ha 8-32-16 (N-P-K) fertilizer at planting as a band application. In addition all plots received 168 kg N/ha NH4NO3 fertilizer metered through a brush applicator when the corn was at the six-leaf stage. The Kentucky bluegrass treatment also received a broadcast application of 132 kg/ha 8-32-16 fertilizer in the fall.								
Comments	This 3-year study investigated the effect of tillage on nutrient loss to both surface and subsurface waters. The experimental design was split-plot (in-time) and used a randomized, complete block design that incorporated four treatments with two replications each. The treatments included continuous corn with conventional tillage (CT), no-tillage(NT), and ridge-tillage (RT); and Kentucky bluegrass (BG). The third year of the study exemplified drought conditions. The plot size was 12.2m x 82.5m, longitudinally centered above a tile drain. BMPs with average to above normal rainfall tended to improve yields, while in the drought year, plots with BMPs were below the control, and all yields were well below average.								

Crop	1	Corn	Yield	5.71	tonnes/ha
Crop	2	Corn	Yield	7.57	tonnes/ha
Crop	3	Corn	Yield	1.91	tonnes/ha

Study ID	**201300705002**	**Study Area**	**NT**	Area (ha)	0.10	Tillage	No Till	Cover Crop	Not specified
Practice ID	2	Practice Name	NT No Till	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-NT-CO-EN			
Irrigation	NR	Irrig. Descrip.							
Soils	Clay Loam- Brookston								
Fertilizer	All plots received 132 kg/ha 8-32-16 (N-P-K) fertilizer at planting as a band application. In addition all plots received 168 kg N/ha NH4NO3 fertilizer metered through a brush applicator when the corn was at the six-leaf stage. The Kentucky bluegrass treatment also received a broadcast application of 132 kg/ha 8-32-16 fertilizer in the fall.								
Comments	This 3-year study investigated the effect of tillage on nutrient loss to both surface and subsurface waters. The experimental design was split-plot (in-time) and used a randomized, complete block design that incorporated four treatments with two replications each. The treatments included continuous corn with conventional tillage (CT), no-tillage(NT), and ridge-tillage (RT); and Kentucky bluegrass (BG). The third year of the study exemplified drought conditions. The plot size was 12.2m x 82.5m, longitudinally centered above a tile drain. BMPs with average to above normal rainfall tended to improve yields, while in the drought year, plots with BMPs were below the control, and all yields were well below average.								

Crop	1	Corn	Yield	6.42	tonnes/ha
Crop	2	Corn	Yield	8.51	tonnes/ha
Crop	3	Corn	Yield	0.88	tonnes/ha

Study ID	**201300705003**	**Study Area**	**RT**	Area (ha)	0.10	Tillage	Ridge Till	Cover Crop	Not specified
Practice ID	3	Practice Name	RT Conv	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Clay Loam- Brookston								
Fertilizer	All plots received 132 kg/ha 8-32-16 (N-P-K) fertilizer at planting as a band application. In addition all plots received 168 kg N/ha NH4NO3 fertilizer metered through a brush applicator when the corn was at the six-leaf stage. The Kentucky bluegrass treatment also received a broadcast application of 132 kg/ha 8-32-16 fertilizer in the fall.								
Comments	This 3-year study investigated the effect of tillage on nutrient loss to both surface and subsurface waters. The experimental design was split-plot (in-time) and used a randomized, complete block design that incorporated four treatments with two replications each. The treatments included continuous corn with conventional tillage (CT), no-tillage(NT), and ridge-tillage (RT); and Kentucky bluegrass (BG). The third year of the study exemplified drought conditions. The plot size was 12.2m x 82.5m, longitudinally centered above a tile drain. BMPs with average to above normal rainfall tended to improve yields, while in the drought year, plots with BMPs were below the control, and all yields were well below average.								

Crop	1	Corn	Yield	6.01	tonnes/ha
Crop	2	Corn	Yield	9.07	tonnes/ha
Crop	3	Corn	Yield	1.06	tonnes/ha

Study ID	**201300705004**	**Study Area**	**BG**	Area (ha)	0.10	Tillage	None	Cover Crop	Kentucky Bluegrass (rather than corn crop)
Practice ID	4	Practice Name	BG Pasture	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NM-CCY-NT-GHP-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Clay Loam- Brookston								
Fertilizer	All plots received 132 kg/ha 8-32-16 (N-P-K) fertilizer at planting as a band application. In addition all plots received 168 kg N/ha NH4NO3 fertilizer metered through a brush applicator when the corn was at the six-leaf stage. The Kentucky bluegrass treatment also received a broadcast application of 132 kg/ha 8-32-16 fertilizer in the fall.								
Comments	This 3-year study investigated the effect of tillage on nutrient loss to both surface and subsurface waters. The experimental design was split-plot (in-time) and used a randomized, complete block design that incorporated four treatments with two replications each. The treatments included continuous corn with conventional tillage (CT), no-tillage(NT), and ridge-tillage (RT); and Kentucky bluegrass (BG). The third year of the study exemplified drought conditions. The plot size was 12.2m x 82.5m, longitudinally centered above a tile drain. BMPs with average to above normal rainfall tended to improve yields, while in the drought year, plots with BMPs were below the control, and all yields were well below average.								

Crop	1	Kentucky Bluegrass	Yield	-999999	tonnes/ha

Crop	2	Kentucky Bluegrass	Yield	-999999	tonnes/ha
Crop	3	Kentucky Bluegrass	Yield	-999999	tonnes/ha

Test Site ID	Test Site Name
2016001010	**Drury et al. 2014**

Location		Ontario	ZZ	CA

Study Citation	2014
	Drury, C.F., Tan, C.S., Welacky, T.W., Reynolds, W.D., Zhang, T.Q., Oloya, T.O., McLaughlin, N.B., Gaynor, J.D.
	Reducing Nitrate Loss in Tile Drainage Water with Cover Crops and Water-Table Management Systems
	Journal of Environmental Quality
NRCS LRR	Canada
NRCS MLRA	Canada
HUC_10	-999999
Test Site Scale	Plot
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)
	Four treatments two replicates
Crops	Corn-Soybean
Study Duration	6 Years

Summary

Planting a winter wheat cover crop (CC) and/or use of controlled tile drainage–subirrigation (CDS) may reduce losses of nitrate (NO3 -) relative to no cover crop (NCC) and/or traditional unrestricted tile drainage (UTD). A 6-yr (1999–2005) corn–soybean study was conducted to determine the effectiveness of CC+CDS, CC+UTD, NCC+CDS, and NCC+UTD treatments for reducing NO3- loss.. The combined use of a cover crop and water-table management system was highly effective for reducing NO3 - loss from cool, humid agricultural soils.

Study ID	**201600101001**	**Study Area**	**NoCCUnTD**	Area (ha)	0.10	Tillage	Chisel plow, disking	Cover Crop	
Practice ID	1	Practice Name	NoCCUnTD	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop, Controlled Drainage	Practice Overview		NM-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	The Brookston clay loam soil at the site is classified as a fine-loamy, mixed, mesic Typic Argiaquoll or as Orthic Humic Gleysol, which averages 28% sand, 35% silt, and 37% clay in the Ap horizon.								
Fertilizer									
Comments									

Crop	1	Corn	Yield	3.16059766	tons/acre
Crop	5	Corn	Yield	2.02343	tons/acre
Crop	9	Corn	Yield	3.4600653	tons/acre

Crop	13	Soybean		Yield	0.70010678	tons/acre			
Crop	17	Soybean		Yield	0.78104398	tons/acre			
Crop	21	Soybean		Yield	0.65963818	tons/acre			
Study ID	**201600101002**	**Study Area**	**NoCCSubIrr**	Area (ha)	0.10	Tillage	Chisel plow, disking	Cover Crop	
Practice ID	2	Practice Name	NoCCSubIrr	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Controlled Drainage	Practice Overview	NM-CCN-CT-CS-ED				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	The Brookston clay loam soil at the site is classified as a fine-loamy, mixed, mesic Typic Argiaquoll or as Orthic Humic Gleysol, which averages 28% sand, 35% silt, and 37% clay in the Ap horizon.								
Fertilizer									
Comments									
Crop	2	Corn		Yield	2.95016094	tons/acre			
Crop	6	Corn		Yield	2.0841329	tons/acre			
Crop	10	Corn		Yield	3.53695564	tons/acre			
Crop	14	Soybean		Yield	0.7082005	tons/acre			
Crop	18	Soybean		Yield	0.69201306	tons/acre			
Crop	22	Soybean		Yield	0.64345074	tons/acre			
Study ID	**201600101003**	**Study Area**	**CCUnTD**	Area (ha)	0.10	Tillage	Chisel plow, disking	Cover Crop	Wheat
Practice ID	3	Practice Name	CCUnTD	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Cover Crop, Controlled Drainage	Practice Overview	NM-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	The Brookston clay loam soil at the site is classified as a fine-loamy, mixed, mesic Typic Argiaquoll or as Orthic Humic Gleysol, which averages 28% sand, 35% silt, and 37% clay in the Ap horizon.								
Fertilizer									
Comments									
Crop	3	Corn		Yield	2.91778606	tons/acre			
Crop	7	Corn		Yield	2.18935126	tons/acre			

Crop	11	Corn	Yield	3.70692376	tons/acre
Crop	15	Soybean	Yield	0.77295026	tons/acre
Crop	19	Soybean	Yield	0.82151258	tons/acre
Crop	23	Soybean	Yield	0.7082005	tons/acre

Study ID	**201600101004**	**Study Area**	**CCSubIrr**	Area (ha)	0.10	Tillage	Chisel plow, disking	Cover Crop	Wheat
Practice ID	4	Practice Name	CCSubIrr	General Practice	Cover Crop, Drainage Water Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Controlled Drainage	Practice Overview	NM-CCY-CT-CS-ED				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	The Brookston clay loam soil at the site is classified as a fine-loamy, mixed, mesic Typic Argiaquoll or as Orthic Humic Gleysol, which averages 28% sand, 35% silt, and 37% clay in the Ap horizon.								
Fertilizer									
Comments	Cover crop and irrigation management								

Crop	4	Corn	Yield	2.80447398	tons/acre
Crop	8	Corn	Yield	2.25410102	tons/acre
Crop	12	Corn	Yield	3.6826426	tons/acre
Crop	16	Soybean	Yield	0.79318456	tons/acre
Crop	20	Soybean	Yield	0.85388746	tons/acre
Crop	24	Soybean	Yield	0.70010678	tons/acre

Test Site ID	Test Site Name
2013005101	**Drury, C. F., 1996**

Location	Harrow	Ontario	XX	CA
Study Citation	1996			
	Drury, C. F., C. S. Tan, J. D. Gaynor, T. O. Oloya and T. W. Welacky.			
	Influence of controlled drainage-subirrigation on surface and tile drainage nitrate loss.			
	J. Environ. Qual. 25:317-324.			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	plot study: complete randomized block			
Crops	Corn			
Study Duration	4 years			

Summary

Controlled drainage-subirrigation (CDS), conservation tillage, and corn (Zea mays L.) production practices were evaluated as methods of reducing NO3- loss through tile drainage. Controlled drainage-subirrigation was used to manage water from precipitation and subirrigation. Samples of tile drainage (5801) and surface runoff (3274) water were collected with autosamplers during each runoff event over a 3-yr period. Annual tile drainage volumes were reduced 24% with CDS compared with the drainage (DR) treatments. Flow weighted mean NO3- concentrations of tile drainage water was reduced 25% from 10.6 mg N/L for the DR treatments to 7.9 mg N/L for the CDS treatments. The average annual NO3- loss was reduced 43% from 25.8 kg N/ha for the DR treatment to 14.6 kg N/ha for the CDS treatments. Eighty-eight to 95% of the NO3- losses from all treatments occurred in the noncrop period (1 Nov. - 31 Apr.). Conservation tillage in combination with CDS reduced annual NO3- losses 49% (11.6 kg N/ha) when compared with the conventional moldboard plow tillage and DR treatment. Annual NO3- loss through surface runoff was increased to 1.9 kg N/ha with eh CDs treatments compared with 1.4 kg N/ha with eh DR treatment, this loss was minor compared with losses incurred through tile drainage. Controlled drainage-subirrigation is a technological advancement in soil and water management as it enables farms to minimize the effect of dry summers on crop growth and reduce NO3- contamination of drainage water.

Study ID	**201300510101**	**Study Area**	**DR - MP**	Area (ha)	0.20	Tillage	Conventional	Cover Crop	Not specified
Practice ID	1	Practice Name	DR - MP	General Practice		Control		Area Type	C
Category	Management	Study Focus	Controlled Drainage, Tillage	Practice Overview		NM-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						

Soils	Brookston clay loam (Typic Argiaquoll)
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.
Comments	(Control: Tile Drainage + Moldboard Plow) This study compares a combination of tillage, drainage and vegetative cover combinations. Sixteen plots represent 4 crop-tillage combinations and two water management treatments with two replications each. Each plot is 15m x 67m on <1% slope. Corn was planted on all plots at a rate of 65,000 plants/ha in 75 cm wide rows. Fertilizer (8-32-16) was banded at a rate of 132 kg/ha, with additional N applied as urea at the 6-leaf stage. Two tile drains ran parallel to each plot.

Crop	1	corn		Yield	-999999	NA			
Study ID	**201300510102**	**Study Area**	**DR - SS**	Area (ha)	0.20	Tillage	Reduced Tillage (Soil Saver)	Cover Crop	Not specified
Practice ID	2	Practice Name	DR - SS	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments	This study compares a combination of tillage, drainage and vegetative cover combinations. Sixteen plots represent 4 crop-tillage combinations and two water management treatments with two replications each. Each plot is 15m x 67m on <1% slope. Corn was planted on all plots at a rate of 65,000 plants/ha in 75 cm wide rows. Fertilizer (8-32-16) was banded at a rate of 132 kg/ha, with additional N applied as urea at the 6-leaf stage. Two tile drains ran parallel to each plot.								

Crop	2	corn		Yield	-999999	NA			
Study ID	**201300510103**	**Study Area**	**DR - MP + IC**	Area (ha)	0.20	Tillage	Conventional	Cover Crop	Ryegrass
Practice ID	3	Practice Name	DR - MP + IC	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage, Cover Crop	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments	This study compares a combination of tillage, drainage and vegetative cover combinations. Sixteen plots represent 4 crop-tillage combinations and two water management treatments with two replications each. Each plot is 15m x 67m on <1% slope. Corn was planted on all plots at a rate of 65,000 plants/ha in 75 cm wide rows. Fertilizer (8-32-16) was banded at a rate of 132 kg/ha, with additional N applied as urea at the 6-leaf stage. Two tile drains ran parallel to each plot.								

Crop	3	corn		Yield	-999999	NA			

Study ID	**201300510104**	**Study Area**	**DR - SS + IC**	Area (ha)	0.20	Tillage	Reduced Tillage (Soil Saver)	Cover Crop	Ryegrass
Practice ID	4	Practice Name	DR - SS + IC	General Practice	Conservation Tillage and Cover Crop			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage, Cover Crop	Practice Overview	NM-CCY-CT-CO-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments	This study compares a combination of tillage, drainage and vegetative cover combinations. Sixteen plots represent 4 crop-tillage combinations and two water management treatments with two replications each. Each plot is 15m x 67m on <1% slope. Corn was planted on all plots at a rate of 65,000 plants/ha in 75 cm wide rows. Fertilizer (8-32-16) was banded at a rate of 132 kg/ha, with additional N applied as urea at the 6-leaf stage. Two tile drains ran parallel to each plot.								

Crop	4	corn	Yield	-999999	NA

Study ID	**201300510105**	**Study Area**	**CDS - MP**	Area (ha)	0.20	Tillage	Conventional	Cover Crop	Not specified
Practice ID	5	Practice Name	CDS - MP	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage,	Practice Overview	NM-CCN-CN-CO-ED				
Irrigation	Yes	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments	This study compares a combination of tillage, drainage and vegetative cover combinations. Sixteen plots represent 4 crop-tillage combinations and two water management treatments with two replications each. Each plot is 15m x 67m on <1% slope. Corn was planted on all plots at a rate of 65,000 plants/ha in 75 cm wide rows. Fertilizer (8-32-16) was banded at a rate of 132 kg/ha, with additional N applied as urea at the 6-leaf stage. Two tile drains ran parallel to each plot.								

Crop	5	corn	Yield	-999999	NA

Study ID	**201300510106**	**Study Area**	**CDS - SS**	Area (ha)	0.20	Tillage	Reduced Tillage (Soil Saver)	Cover Crop	Not specified
Practice ID	6	Practice Name	CDS - SS	General Practice	Drainage Water Management and Conservation Tillage			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage	Practice Overview	NM-CCN-CT-CO-ED				
Irrigation	Yes	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments									

Crop	6	corn	Yield	-999999	NA

Study ID	**201300510107**	**Study Area**	**CDS - MP + IC**	Area (ha)	0.20	Tillage	Conventional	Cover Crop	Ryegrass
Practice ID	7	Practice Name	CDS - MP + IC	General Practice	Drainage Water Management and Conservation Tillage and Cover Crop			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage, Cover Crop	Practice Overview	NM-CCY-CN-CO-ED				
Irrigation	Yes	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments									

Crop	1	corn	Yield	-999999	
Crop	7	corn	Yield	-999999	NA

Study ID	**201300510108**	**Study Area**	**CDS - SS + IC**	Area (ha)	0.20	Tillage	Reduced Tillage (Soil Saver)	Cover Crop	Ryegrass
Practice ID	8	Practice Name	CDS - SS + IC	General Practice	Drainage Water Management and Conservation Tillage and Cover Crop			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Tillage, Cover Crop	Practice Overview	NM-CCY-CT-CO-ED				
Irrigation	Yes	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	Fertilizer (8-32-16) was banded beside the seed at a rate of 132 kg/ha. Urea (46-0-0) was applied with a brush applicator of custom design at the six-leaf stage. In 1991, urea was applied at 115 kg N/ha. This rate was adjusted from 170 kg N/ha to account for N released from the previous 2yr alfalfa. in 1992 to 1994, side-dressed urea as applied at an average rate of 167 kg N/ha, based on the average NO3 soil test of soil samples collected on the day of planting. Atrazine, metribuzin, and metolachlor were banded over the corn row immediately after planning to control weeds.								
Comments	This study compares a combination of tillage, drainage and vegetative cover combinations. Sixteen plots represent 4 crop-tillage combinations and two water management treatments with two replications each. Each plot is 15m x 67m on <1% slope. Corn was planted on all plots at a rate of 65,000 plants/ha in 75 cm wide rows. Fertilizer (8-32-16) was banded at a rate of 132 kg/ha, with additional N applied as urea at the 6-leaf stage. Two tile drains ran parallel to each plot.								

Crop	8	corn	Yield	-999999	NA

Test Site ID	Test Site Name
2013005136	**Gaynor, J. D., 1995**

Location	Harrow	Ontario	XX	CA
Study Citation	1995			
	Gaynor, J.D. and W.I. Findlay.			
	Soil and phosphorous loss from conservation and conventional tillage in corn production.			
	J. Environ. Qual. 24:734-741.			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	plot study: no replications			
Crops	Corn			
Study Duration	3 years			

Summary

Conservation tillage is encouraged in southwestern Ontario by concern for soil erosion and compaction. The contribution of agriculture to eutrophication of the Great Lakes by P is also at issue. Soil loss and ortho-P transport were measured from a conventional and two conservation tillage treatments (zero and ridge tillage) from January 1988 to 30 Sept. 1990 to evaluate their impact on meeting Great Lakes water quality objectives for P. Sediment concentration from the poorly drained, Brookston clay loam (clayey, mixed, mesic Typic Haplaquolls), cropped to corn (Zea mays L.) was 2.1 times larger in surface runoff than tile discharge (0.20 g/L) but tile discharge contributed 44 to 65% of the soil loss probably from preferential flow. Conservation tillage reduced average soil loss 49% from conventional tillage (899 kg/ha). Conservation tillage increased ortho-P concentrations in runoff 2.2 times from conventional tillage (0.25 mg/L). Orthophosphate transport decreased in the order zero>ridge>conventional tillage. Average ortho-P was 1.7 to 2.7 times greater from conservation than conventional tillage (559 g/ha/yr). Subsurface drainage accounted for 55 to 68% of the ortho-P transported. Transport of total soluble P and total P (sum of sediment-attached P and soluble P, only measured in 1990) increased 2.2 and 2.0 times, respectively, with conservation than conventional tillage. Dissolved P accounted for 84 to 93% of the P transported from the three tillage treatments. Sediment-attached P constituted 7 to 16% of total P loss. Conservation tillage effectively reduced soil erosion but increased P loss.

Study ID	**201300513601**	**Study Area**	**Ridge**	Area (ha)	0.10	Tillage	Ridge Till	Cover Crop	None
Practice ID	234	Practice Name	RidgeTill	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CT-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Clay Loam- Brookston								
Fertilizer	Side-dressed fertilizer (132 kg/ha 8-32-16); a brush applicator of custom design, was used for the midseason fertilizer application of 168 kg/ha 34-0-0; fertilizer was subsurface applied in a band 7 to 10 cm from the seed at a depth of 6 to 8 cm.								
Comments	This study compared the impact of no-till and ridge-tillage on runoff from continuous corn. Annual concentration means are given for both surface and subsurface drainage.								

Crop	1	Corn	Yield	-999999
Crop	2	Corn	Yield	-999999

Crop	3	Corn	Yield	-999999	

Study ID	**201300513602**	**Study Area**	**Zero**	Area (ha)	0.10	Tillage	No Till	Cover Crop	None
Practice ID	235	Practice Name	NoTill	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-NT-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Clay Loam- Brookston								
Fertilizer	Side-dressed fertilizer (132 kg/ha 8-32-16); a brush applicator of custom design, was used for the midseason fertilizer application of 168 kg/ha 34-0-0; fertilizer was subsurface applied in a band 7 to 10 cm from the seed at a depth of 6 to 8 cm.								
Comments	This study compared the impact of no-till and ridge-tillage on runoff from continuous corn. Annual concentration means are given for both surface and subsurface drainage.								

Crop	1	Corn	Yield	-999999	
Crop	2	Corn	Yield	-999999	
Crop	3	Corn	Yield	-999999	

Study ID	**201300513603**	**Study Area**	**Conventional**	Area (ha)	0.10	Tillage	Conventional	Cover Crop	None
Practice ID	233	Practice Name	Conventional	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Clay Loam- Brookston								
Fertilizer	Side-dressed fertilizer (132 kg/ha 8-32-16); a brush applicator of custom design, was used for the midseason fertilizer application of 168 kg/ha 34-0-0; fertilizer was subsurface applied in a band 7 to 10 cm from the seed at a depth of 6 to 8 cm.								
Comments	This study compared the impact of no-till and ridge-tillage on runoff from continuous corn. Annual concentration means are given for both surface and subsurface drainage.								

Crop	1	Corn	Yield	-999999	
Crop	2	Corn	Yield	-999999	
Crop	3	Corn	Yield	-999999	

Test Site ID	Test Site Name
2013005525	**Ghidey, F., 1999**

Location	Centralia	Boone	MO	US
Study Citation	1999			
	Ghidey, F., E. E. Alberts, N. R. Kitchen, and R. N. Lerch.			
	Farming system effects on nitrate loss to surface runoff.			
	Paper No. 99-2189. 2000 ASAE International Meeting. American Society of Agricultural Engineers: St. Joseph, Michigan.			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Claypan Areas			
HUC_10	0711000601	Test Site Scale	Field	
Experimental Design Type/ Description	Multiple Treatments, No Control, No Replication			
	The effects of crop management systems including tillage, rate of fertilizer application, and type of application on the transport of nitrates in surface runoff were studied on two field-size watersheds.			
Crops	Corn, Soybeans, Sorghum			
Study Duration	4 years			

Summary

The effects of crop management systems including tillage, rate of fertilizer application, and type of application on the transport of nitrates in surface runoff were studied on two field-size watershed located in the claypan soil region of north-central Missouri. Water samples were collected from the drainage areas for NO3-N and NH4-N analysis during each runoff event from 1993-1997. In general, the study showed that method of incorporation, runoff volume, and timing of runoff event relative to date of application had greater influence in the loss of nitrates to surface runoff than application rate.

Study ID	**201300552501**	**Study Area**	**FS1**	Area (ha)	35.49	Tillage	Minimum Till, Fertilizer Incorporated	Cover Crop	Not specified
Practice ID	751	Practice Name	Field 1	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.	Not applicable						
Soils	70% Adco silt loam with 0-1 % slope, 20% of Mexico Silt clay loam with 1-3% slope, and 10% Mexico silt loam with 0-2% slope.								
Fertilizer	Nitrogen (as UAN) was applied at the rates of 190, 123, and 190 kg/ha in 1993,1995, and 1997, respectively. The fertilizer was broadcast and incorporated with field cultivator prior to planting.								
Comments	Field 1 was farmed using a high chemical input, minimum-till corn and soybean rotation with the goals of maximizing grain yield and profit. Fertilizer was broadcast and incorporated prior to planting each spring. No runoff was measured in 1996.								

Crop	1	corn	Yield	-999999
Crop	2	soybean	Yield	-999999
Crop	3	grain sorghum	Yield	-999999

Crop	4	soybean	Yield	-999999	
Crop	5	corn	Yield	-999999	

Study ID	**201300552502**	**Study Area**	**FS2**	Area (ha)	24.20	Tillage	Minimum till, then no till in 1997	Cover Crop	Not specified
Practice ID	752	Practice Name	Field 2	General Practice		Conservation Tillage and Nutrient Management		Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-NT-SBG-EN			
Irrigation	NR	Irrig. Descrip.	Not applicable						
Soils	30% Adco silt loam with 0-1% slope, 30% Mexico silt loam with 1-3% slope, 15% Putnam silt loam with 0-1% slope, and 25% Leonard silt clay loam with 1-4% slope.								
Fertilizer	Nitrogen (as UAN) was applied at the rates of 190, 123, and 190 kg/ha in 1993,1995, and 1997, respectively. The fertilizer was broadcast and incorporated with field cultivator prior to planting. In 1997, FS2 was under no-till system and nitrogen (as anhydrous ammonia) at the rate of 127 kg/ha was knifed-in 2 d before planting. On planting date, nitrogen (as UAN) at the rate of 20 kg/ha was surface applied and not incorporated.								
Comments	Field 2 was farmed using medium chemical input minimum-till sorghum-soybean rotation. This farming system was designed to maximize profit and water quality benefits. In 1993, fertilizer was broadcast and incorporated; in 1995 it was not incorporated, and in 1997, anhydrous ammonia was knifed in prior to planting with an additional amount surface banded. FS2 was under no-tillage in 1997.								

Crop	6	grain sorghum	Yield	-999999
Crop	7	soybean	Yield	-999999
Crop	8	grain sorghum	Yield	-999999
Crop	9	soybean	Yield	-999999
Crop	10	grain sorghum	Yield	-999999

Test Site ID	Test Site Name
2013005148	Ginting, D., 1998

Location	Morris	Stevens	MN	US
Study Citation	1998			
	Ginting, D., J. F. Moncrief, S. C. Gupta and S. D. Evans.			
	Interaction between manure and tillage system on phosphorus uptake and runoff losses			
	J. Environ. Qual. 27:1403-1410.			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Till Plains			
HUC_10	0702000203	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	plot study: complete randomized block			
Crops	Corn			
Study Duration	3 years			

Summary

Application of manure on soils having high P test has raised concerns over the eutrophication of lakes and rivers. The objective of this study was to evaluate the effects of one time application of 164 kg P/ha form solid beef (Bos taurus L.) manure on soil Olsen P dynamics, P uptake by corn (Zea mays L.) grain, and P losses as total P (TP), particulate P (PP), and dissolved molybdate reactive P (DMRP) in both snowmelt and rainfall runoff under ridge tillage (RT) and moldboard plow (MP) systems for 1992 to 1994. Soil O was consistently higher in the manure than no manure treated plots (17.9 vs. 12.3 mg/kg in 1993 and 23.7 vs. 13.8 mg/kg in 1994. Phosphorus uptake was greater from the manure than no manure treated plots (24.5 vs. 19.8 kg/ha and 23.5 vs. 18.8 kg/ha). Annual PP and TP losses were either similar or lower from manure than no manure treated plots. Particulate P losses by rainfall runoff were lower from the RT vs. MP systems (0.25 vs. 1.95 kg/ha in 1993 and 0.006 vs. 0.65 kg/ha in 1994). The opposite was apparent for DMRP losses in snowmelt, which were higher from the RT than MP system (0.11 vs. 0.01 kg/ha and 0.14 vs. 0.03 kg/ha). The RT system is an environmentally better system than the MP system due to its substantial reduction in annual PP and TP losses.

Study ID	**201300514801**	**Study Area**	**MP - Manure**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	None
Practice ID	521	Practice Name	MP	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						

Soils	Forman (fine-loamy, mixed Udic Argiboroll)-Buse (fine-loamy, mixed Udorthentic Haploboroll)
Fertilizer	The manure treatment was a one-time broadcast application of solid beef manure at 16.3 mg/ha (dry wt. basis). Manure was applied with a box type manure spreader. Manure application provided 164 kg total P, 481 kg Kjeldahl-N, and 375 kg total K per hectare.
Comments	Twelve erosion plots (each 22m x 3m) cropped with continuous corn, were used to quantify P losses by snowmelt and rainfall. The plots were on a 12% slope, and were isolated by corrugated steel plates to accommodate 4 rows of corn, using a split plot design. Four treatments were applied with three replications each: 2 levels of manure application, and ridge-till vs. conventional moldboard plowing. However, the tillage treatment is the only comparison relevant to this data base. Therefore, results are reported for these two treatments as geometric means over both manure treatments. Total runoff was collected from each event and plot, with a well-mixed, composite sample gathered from the mixture.

Crop	1	Corn	Yield	-999999
Crop	2	Corn	Yield	7 Mg/ha

Crop	3	Corn	Yield	9.8	Mg/ha

Study ID	**201300514802**	**Study Area**	**MP - No Manure**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	None
Practice ID	522	Practice Name	MP	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NM-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Forman (fine-loamy, mixed Udic Argiboroll)-Buse (fine-loamy, mixed Udorthentic Haploboroll)								
Fertilizer	On July 16, 1993, 45 kg N/ha (NH4NO3) was broadcast applied on no manure plots to ensure sufficient N for corn production.								
Comments	Twelve erosion plots (each 22m x 3m) cropped with continuous corn, were used to quantify P losses by snowmelt and rainfall. The plots were on a 12% slope, and were isolated by corrugated steel plates to accommodate 4 rows of corn, using a split plot design. Four treatments were applied with three replications each: 2 levels of manure application, and ridge-till vs. conventional moldboard plowing. However, the tillage treatment is the only comparison relevant to this data base. Therefore, results are reported for these two treatments as geometric means over both manure treatments. Total runoff was collected from each event and plot, with a well-mixed, composite sample gathered from the mixture.								

Crop	1	Corn	Yield	-999999	
Crop	2	Corn	Yield	6.6	Mg/ha
Crop	3	Corn	Yield	9.3	Mg/ha

Study ID	**201300514803**	**Study Area**	**RT - Manure**	Area (ha)	0.01	Tillage	Ridge Till	Cover Crop	None
Practice ID	523	Practice Name	RT	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-CT-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Forman (fine-loamy, mixed Udic Argiboroll)-Buse (fine-loamy, mixed Udorthentic Haploboroll)								
Fertilizer	The manure treatment was a one-time broadcast application of solid beef manure at 16.3 mg/ha (dry wt. basis). Manure was applied with a box type manure spreader. Manure application provided 164 kg total P, 481 kg Kjeldahl-N, and 375 kg total K per hectare.								
Comments	Twelve erosion plots (each 22m x 3m) cropped with continuous corn, were used to quantify P losses by snowmelt and rainfall. The plots were on a 12% slope, and were isolated by corrugated steel plates to accommodate 4 rows of corn, using a split plot design. Four treatments were applied with three replications each: 2 levels of manure application, and ridge-till vs. conventional moldboard plowing. However, the tillage treatment is the only comparison relevant to this data base. Therefore, results are reported for these two treatments as geometric means over both manure treatments. Total runoff was collected from each event and plot, with a well-mixed, composite sample gathered from the mixture.								

Crop	1	Corn	Yield	-999999	
Crop	2	Corn	Yield	7	Mg/ha
Crop	3	Corn	Yield	9.8	Mg/ha

Study ID	**201300514804**	**Study Area**	**RT - No Manure**	Area (ha)	0.01	Tillage	Ridge Till	Cover Crop	None
Practice ID	524	Practice Name	RT	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Forman (fine-loamy, mixed Udic Argiboroll)-Buse (fine-loamy, mixed Udorthentic Haploboroll)								
Fertilizer	On July 16, 1993, 45 kg N/ha (NH4NO3) was broadcast applied on no manure plots to ensure sufficient N for corn production.								
Comments	Twelve erosion plots (each 22m x 3m) cropped with continuous corn, were used to quantify P losses by snowmelt and rainfall. The plots were on a 12% slope, and were isolated by corrugated steel plates to accommodate 4 rows of corn, using a split plot design. Four treatments were applied with three replications each: 2 levels of manure application, and ridge-till vs. conventional moldboard plowing. However, the tillage treatment is the only comparison relevant to this data base. Therefore, results are reported for these two treatments as geometric means over both manure treatments. Total runoff was collected from each event and plot, with a well-mixed, composite sample gathered from the mixture.								

Crop	1	Corn	Yield	-999999	
Crop	2	Corn	Yield	6.6	Mg/ha
Crop	3	Corn	Yield	9.3	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013007053	**Goulet et al. 2006**

Location	Quebec City	Quebec	XX	CA
Study Citation	2006			
	Goulet, M., J. Gallichand, M. Duchemin, and M. Giroux.			
	Measured and Computed Phosphorus Losses by Runoff and Subsurface Drainage in Eastern Canada			
	Applied Eng. Agric. 22(2): 203-213.			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments, No Control, No Replication			
	Nine plots equipped for measurement and sampling water from runoff and subsurface drainage			
Crops	Canola, Corn, Barley, Grass			
Study Duration	2 years			

Summary

This research was conducted to compare results of a PI model with measured values of P losses, to an adjacent watercourse, from nine 0.19-ha experimental plots monitored from January 2001 to December 2002. The experimental setup was located near Québec City, Canada, and allowed measurement of both surface and subsurface P losses. The 18 computed PI annual risk values (9 plots × 2 years) ranged from low to moderate. During the monitoring period, 98% of the water and 95% of the P moved out of the plots via the subsurface drainage system. P losses through subsurface drains represented, on average, 514 g total P ha-1 yr-1 compared to 26 g total P ha-1 yr-1 by surface runoff. On average, 84% of the total P losses were under particulate form. A stepwise regression showed that only three of the ten PI model components (total P budget, soil erosion, and organic manure application) were responsible for 86% of the measured total P losses variations. The correlation between PI values and measured total P losses (r = 0.63) was significant at the 0.10 probability level. Fixing all PI components to a value of 1.0 increased the correlation (r = 0.73), indicating possible improvement of the predictive capability of the model through optimization of the weights.

Study ID	**201300705301**	**Study Area**	**1**	Area (ha)	0.22	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	1	Practice Name	1 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	45 kg/ha/yr P2O5 mineral fertilizer broadcasted in May								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA
Crop	10	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA

Study ID	**201300705302**	**Study Area**	**2**	Area (ha)	0.22	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	2	Practice Name	2 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	50 kg/ha/yr P2O5 beef manure with manure spreader after 1st cut								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	2	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA
Crop	11	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA

Study ID	**201300705303**	**Study Area**	**3**	Area (ha)	0.22	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	3	Practice Name	3 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	68 kg/ha/yr P2O5 organic fertilizer at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	3	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA
Crop	12	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA

Study ID	**201300705304**	**Study Area**	**4**	Area (ha)	0.22	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	4	Practice Name	4 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	21 kg/ha/yr P2O5 organic fertilizer at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	4	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA
Crop	13	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA

Study ID	**201300705305**	**Study Area**	**5**	Area (ha)	0.12	Tillage	Chisel Plow	Cover Crop	Not specified
Practice ID	5	Practice Name	5 Cons Till	General Practice	Reduced Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	86 kg/ha/yr P2O5 mineral fertilizer using row spreading at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. Chisel plow.								

Crop	5	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA
Crop	14	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA

Study ID	**201300705306**	**Study Area**	**6**	Area (ha)	0.11	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	6	Practice Name	6 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	44 kg/ha/yr P2O5 mineral fertilizer at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	6	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA
Crop	15	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA

Study ID	**201300705307**	**Study Area**	**7**	Area (ha)	0.11	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	7	Practice Name	7 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	64 kg/ha/yr P2O5 organic fertilizer at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	7	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA
Crop	16	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA

Study ID	**201300705308**	**Study Area**	**8**	Area (ha)	0.11	Tillage	Chisel Plow	Cover Crop	Not specified
Practice ID	8	Practice Name	8 Cons Till	General Practice	Reduced Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	222 kg/ha/yr P2O5 liquid swine manure using row spreading at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. Chisel plow.								

Crop	8	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA
Crop	17	CACCB (4 yr. rotation of Canola, Corn, C	Yield	-999999	NA

Study ID	**201300705309**	**Study Area**	**9**	Area (ha)	0.20	Tillage	Conventional (moldboard plow)	Cover Crop	Not specified
Practice ID	9	Practice Name	9 Conv NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Les Bras								
Fertilizer	70 kg/ha/yr P2O5 mineral fertilizer at sowing								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	9	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA
Crop	18	BMMM (4 yr. rotation of barley and mea	Yield	-999999	NA

Test Site ID	Test Site Name
2016002015	**Grande et al., 2005**

Location		Columbia	WI	US
Study Citation	2005			
	Grande, J. D., Karthikeyan, K. G., Miller, P. S., Powell, J. M.			
	Corn Residue Level and Manure Application Timing Effects on Phosphorus Losses in Runoff; Residue Level and Manure Application Timing Effectson Runoff and Sediment Losses			
	Journal of Environmental Quality			
NRCS LRR	Lake State Fruit, Truck Crop, and Dairy Region			
NRCS MLRA	Southern Wisconsin and Northern Illinois Drift Plain			
HUC_10	0709000205	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	Completely randomized design with two independent blocks, with replication.			
Crops	Corn			
Study Duration	2 years			

Summary

The effects of residue level and manure application timing on runoff, sediment, and phosphorus losses from no-till corn were examined. Treatments included conventional corn grain (G) and silage (SL) and nonconventional, high-cut (60-65 cm) silage (SH). Corn harvesting treatments were subjected to different manure application regimes: no manure (N) or surface application in fall (F) or spring (S). Simulated rainfall (76 mm/h; 1 h) was applied in spring and fall for two years (2002-2003), runoff from 2.0- x 1.5-m plots collected and analyzed for sediment, dissolved reactive phosphorus (DRP), and total phosphorus (TP). Runoff volume was inversely related to residue cover. Total P and DRP loads were inversely related to percent residue cover, but both TP and DRP concentrations were unaffected by residue level. Manure addition to silage plots reduced spring runoff by 71 to 88%. Sediment loads were also 85 to 97% lower from SH-S compared with SL-N in all four seasons. Manure application increased DRP concentrations in spring runoff by two to five times but did not significantly affect DRP loads, since higher concentrations were offset by lower runoff volumes. Recently applied manure and higher residue levels achieved by high-cutting silage can substantially lower sediment losses in spring runoff when soil is most susceptible to erosion. By itself, higher residue cover achieved by high-cutting silage was often insufficient to lower P losses; however, the combination of manure application and higher residue levels significantly reduced P losses from corn fields harvested for silage.

Study ID	**201600201501**	**Study Area**	**Conventional Corn Grain - No Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	1	Practice Name	Conventional Corn Grain - No Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NF-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	1	Corn	Yield	10.1	Mg/acre
Crop	10	Corn	Yield	8.2	Mg/acre

Study ID	**201600201502**	**Study Area**	**High Cut Silage - No Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	2	Practice Name	High Cut Silage - No Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NF-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	2	Corn	Yield	30.7	Mg/acre
Crop	11	Corn	Yield	25.8	Mg/acre

Study ID	**201600201503**	**Study Area**	**Low Cut Silage - No Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	3	Practice Name	Low Cut Silage - No Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NF-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	3	Corn	Yield	30.7	Mg/acre
Crop	12	Corn	Yield	25.8	Mg/acre

Study ID	**201600201504**	**Study Area**	**Conventional Corn Grain - Fall Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	4	Practice Name	Conventional Corn Grain - Fall Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	4	Corn	Yield	10.1	Mg/acre
Crop	13	Corn	Yield	8.2	Mg/acre

Study ID	**201600201505**	**Study Area**	**High Cut Silage - Fall**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	5	Practice Name	High Cut Silage - Fall Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	5	Corn	Yield	30.7	Mg/acre
Crop	14	Corn	Yield	25.8	Mg/acre

Study ID	**201600201506**	**Study Area**	**Low Cut Silage - Fall Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	6	Practice Name	Low Cut Silage - Fall Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	6	Corn	Yield	30.7	Mg/acre
Crop	15	Corn	Yield	25.8	Mg/acre

Study ID	**201600201507**	**Study Area**	**Conventional Corn Grain - Spring Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	7	Practice Name	Conventional Corn Grain - Spring Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	7	Corn	Yield	10.1	Mg/acre
Crop	16	Corn	Yield	8.2	Mg/acre

Study ID	**201600201508**	**Study Area**	**High Cut Silage - Spring Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	8	Practice Name	High Cut Silage - Spring Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	8	Corn	Yield	30.7	Mg/acre
Crop	17	Corn	Yield	25.8	Mg/acre

Study ID	**201600201509**	**Study Area**	**Low Cut Silage - Spring Manure**	Area (ha)	0.05	Tillage	No-Till	Cover Crop	None
Practice ID	9	Practice Name	Low Cut Silage - Spring Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Plano silt loam soil (fine-silty, mixed, superactive, mesic Typic Argiudoll)								
Fertilizer									
Comments									

Crop	9	Corn	Yield	30.7	Mg/acre
Crop	18	Corn	Yield	25.8	Mg/acre

Test Site ID	Test Site Name
2013007004	**Grigg et al. 2004**

Location	Baton Rouge	East Baton Rouge	LA	US
Study Citation	2004			
	Grigg, B.C., L.M. Southwick, J.L. Fouss, and T.S. Kornecki.			
	Climate Impacts on Nitrate Loss in Drainage Waters from a Southern Alluvial Soil			
	Trans. ASAE 47(2): 445-451.			
NRCS LRR	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region			
NRCS MLRA	Carolina and Georgia Sand Hills			
HUC_10	0807020208	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	plot study: complete randomized block			
Crops	Corn			
Study Duration	2 years			

Summary

Field studies in the Lower Mississippi River Valley region were used to evaluate the impact of climate (rainfall) on nitrate loss from agricultural fields in both normal (1996) and drought (1999) periods at the Ben Hur Water Quality Site in Baton Rouge, Louisiana. Four replicates of two treatments, surface drainage only (SUR) and surface drainage + deep controlled drainage (DCD), were initiated on 0.21 ha plots planted to corn (Zea mays L). After each rainfall/runoff event, the volumes of runoff and subsurface drainage were analyzed for soluble nitrate concentration and loss. No significant drainage treatment impacts were found on runoff volume and nitrate loss in runoff. Nitrate loss in runoff was impacted by climate, with a four-fold decrease in nitrate loss during the drought, caused by decreased volume of runoff. Conversely, the mass of nitrate loss in leachate increased two-fold during the drought. Diverting subsurface drainage effluent (DCD) to surface receiving waters increased nitrate transport to these waters by 2.6 times in the normal climate, and over ten-fold during the drought, compared to SUR management. In either climate, but particularly during drought, subsurface drainage could potentially accelerate eutrophication of receiving waters of this region. When compared to DCD, these results suggest that SUR should be the water Management practice in this region.

Study ID	**201300700401**	**Study Area**	**Normal Year- SUR**	Area (ha)	0.21	Tillage	Minimum Till	Cover Crop	None
Practice ID	1	Practice Name	Normal Year- SUR Cons Till	General Practice	Controlled Drainage, Conservation Tillage			Area Type	C
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Commerce								
Fertilizer	Liquid nitrogen fertilizer was injected below the soil surface adjacent to the crop row at a rate of 224 kg N/ha-yr, based on soil analysis and fertilizer recommendations. Fertilizer N was applied (three-way split) before June 10 of each year: 25% at planting, 50% at 30 d after emergence, and the remaining 25% in early June.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. Minimal tillage.								

Crop 1 Corn Yield 5.9 Mg/ha

Study ID	**201300700402**	**Study Area**	**Normal Year- DCD (Deep Control Drainage)**	Area (ha)	0.21	Tillage	Minimum Till	Cover Crop	None
Practice ID	2	Practice Name	Normal Year- DCD Cons Till	General Practice	Controlled Drainage, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-ED				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Commerce								
Fertilizer	Liquid nitrogen fertilizer was injected below the soil surface adjacent to the crop row at a rate of 224 kg N/ha-yr, based on soil analysis and fertilizer recommendations. Fertilizer N was applied (three-way split) before June 10 of each year: 25% at planting, 50% at 30 d after emergence, and the remaining 25% in early June.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. Minimal tillage.								

Crop 2 Corn Yield 5.7 Mg/ha

Study ID	**201300700403**	**Study Area**	**Drought Year- SUR**	Area (ha)	0.21	Tillage	Minimum Till	Cover Crop	None
Practice ID	3	Practice Name	Drought Year- SUR Cons Till	General Practice	Controlled Drainage, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Commerce								
Fertilizer	Liquid nitrogen fertilizer was injected below the soil surface adjacent to the crop row at a rate of 224 kg N/ha-yr, based on soil analysis and fertilizer recommendations. Fertilizer N was applied (three-way split) before June 10 of each year: 25% at planting, 50% at 30 d after emergence, and the remaining 25% in early June.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. Minimal tillage.								

Crop 3 Corn Yield 2.4 Mg/ha

Study ID	**201300700404**	**Study Area**	**Drought Year- DCD (Deep Control Drainage)**	Area (ha)	0.21	Tillage	Minimum Till	Cover Crop	None
Practice ID	4	Practice Name	Drought Year- DCD Cons Till	General Practice	Controlled Drainage, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-ED				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Commerce								
Fertilizer	Liquid nitrogen fertilizer was injected below the soil surface adjacent to the crop row at a rate of 224 kg N/ha-yr, based on soil analysis and fertilizer recommendations. Fertilizer N was applied (three-way split) before June 10 of each year: 25% at planting, 50% at 30 d after emergence, and the remaining 25% in early June.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. Minimal tillage.								

Crop	4	Corn	Yield	3.1	Mg/ha

Test Site ID	Test Site Name
2013005159	**Guilliard, Karl, 1999**

Location	Storrs	Tolland	CT	US
Study Citation	1999			
	Guilliard, K., T. F. Morris, and K. L. Kopp			
	The Pre-Sidedress Soil Nitrate Test and Nitrate Leaching from Corn			
	J. Environ. Qual. 28(6):1845-1852.			
NRCS LRR	Northeastern Forage and Forest Region			
NRCS MLRA	Connecticut Valley			
HUC_10	0110000202	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	plot study: complete randomized block			
Crops	Corn			
Study Duration	2 years			

Summary

The pre-sidedress soil nitrate test (PSNT) is recommended in many states as a best management practice (BMP) for corn (Zea mays L.). A 2-yr study was conducted in Connecticut on a Woodbridge fine sandy loam soil (coarse loamy, mixed mesic Aquic Dystrochrept) to determine NO3-N concentrations and losses in soil water from corn managed with three different N fertilization regimes: (i) PRE, 196 kg N/ha applied preplant; (ii) PSNT-1, 90 kg N/ha applied at preplant and any remaining N needs estimated by the PSNT (0 kg/ha in 1995 and 45 kg/ha in 1996); and (iii) PSNT-2, no preplant N and all N needs estimated by the PSNT (34 kg/ha in 1995 and 123 kg/ha in 1996). Percolate was collected with zero-tension pan lysimeters. Flow-weighted NO3-N concentrations from the PRE treatment were 22.3 mg/L in 1995 and 17.4 mg/L in 1996; the PSNT treatments were <8.0 mg/L. Losses of NO3-N as a percent of N applied in 1995 were 20%, 10%, and 12% for PRE, PSNT-1, and PSNT-2 respectively, and 31%, 21%, and 21% , respectively, in 1996. Greatest leaching losses occurred after corn harvest. Corn yields were not significantly (P>0.05) different among N treatments. These findings suggest that a well calibrated soil N test can reduce excess fertilization and the potential for NO3 contamination of groundwater.

Study ID	**201300515901**	**Study Area**	**PRE**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Winter rye
Practice ID	238	Practice Name	PRE	General Practice	Control			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCY-CN-CO-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						

Soils	Woodbridge fine sandy loam (Aquic Dystrochrept)
Fertilizer	Preplant N fertilization at a rate of 196 kg N/ha, which was calculated using a yield goal of 16.8 mg dry matter/ha with a previous cropping history of corn grown for silage
Comments	This study used a randomized complete block design with its plot study using 3 treatments, 3 replicates each. Lysimeters were used to measure leachate. The control (PrePlant) applied recommended nitrogen fertilizer (196kg N/ha) before planting. The second treatment had 90 kg N/ha applied pre-plant, and additional N applied pre-sidedress (PSNT1) as recommended by a soil nitrate test. The third treatment had no pre-plant N applied, and only applied the amount indicated by the soil nitrate test (PSNT2). Corn was grown on all three plots.

Crop	1	Corn	Yield	18.3 Mg/ha
Crop	2	Corn	Yield	16.1 Mg/ha

Study ID	**201300515902**	**Study Area**	**PSNT-1**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Winter rye
Practice ID	239	Practice Name	PSNT-1	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	NR	Irrig. Descrip.	natural rainfall						
Soils	Woodbridge fine sandy loam (Aquic Dystrochrept)								
Fertilizer	90 kg N/ha preplant with any additional N needs estimated by the PSNT and applied as a side-dress. This is the current recommendation procedure for use of the PSNT in Connecticut for nonmanured soils.								
Comments	This study used a randomized complete block design with its plot study using 3 treatments, 3 replicates each. Lysimeters were used to measure leachate. The control (PrePlant) applied recommended nitrogen fertilizer (196kg N/ha) before planting. The second treatment had 90 kg N/ha applied pre-plant, and additional N applied pre-sidedress (PSNT1) as recommended by a soil nitrate test. The third treatment had no pre-plant N applied, and only applied the amount indicated by the soil nitrate test (PSNT2). Corn was grown on all three plots.								

Crop	1	Corn	Yield	18.1	Mg/ha
Crop	2	Corn	Yield	15.7	Mg/ha

Study ID	**201300515903**	**Study Area**	**PSNT-2**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Winter rye
Practice ID	240	Practice Name	PSNT-2	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Woodbridge fine sandy loam (Aquic Dystrochrept)								
Fertilizer	No preplant N and N needs estimated by the PSNT and applied as a side-dress, the current recommendation procedure for used of the PSNT in Connecticut for manured soils.								
Comments	This study used a randomized complete block design with its plot study using 3 treatments, 3 replicates each. Lysimeters were used to measure leachate. The control (PrePlant) applied recommended nitrogen fertilizer (196kg N/ha) before planting. The second treatment had 90 kg N/ha applied pre-plant, and additional N applied pre-sidedress (PSNT1) as recommended by a soil nitrate test. The third treatment had no pre-plant N applied, and only applied the amount indicated by the soil nitrate test (PSNT2). Corn was grown on all three plots.								

Crop	1	Corn	Yield	15.4	Mg/ha
Crop	2	Corn	Yield	15.3	Mg/ha

Test Site ID	Test Site Name
2013005161	**Hall, D. W., 1993**

Location	Ephrata	Lancaster	PA	US
Study Citation	1993			
	Hall, D. W. and D. W. Risser.			
	Effects of Agricultural Nutrient Management on Nitrogen Fate and Transport in Lancaster County, Pennsylvania.			
	Water Resour. Bull. 29(1):55-76.			
NRCS LRR	Northern Atlantic Slope Diversified Farming Region			
NRCS MLRA	Conestoga Headwaters RCWP 148			
HUC_10	0205030609	Test Site Scale	Field	
Experimental Design Type/ Description	Before-After			
	pre- and post-BMP			
Crops	Corn, tobacco, rye, grass, fruits, vegetables			
Study Duration	6 years			

Summary

Nitrogen inputs to, and outputs from, a 55-acre site in Lancaster County, Pennsylvania, were estimated to determine the pathways and relative magnitude of loads of nitrogen entering and leaving the site, and to compare the loads of nitrogen before and after the implementation of nutrient management. Inputs of nitrogen to the site were manure fertilizer, commercial fertilizer, nitrogen in precipitation, and nitrogen in groundwater inflow; and these sources averaged 93, 4, 2, and 1 percent of average annual nitrogen additions, respectively. Outputs of nitrogen from the site were nitrogen in harvested crops, loads of nitrogen in surface runoff, volatilization of nitrogen, and loads of nitrogen in ground-water discharge, which averaged 37, less than 1, 25, and 38 percent of average annual nitrogen removals from the site, respectively. Virtually all of the nitrogen leaving the site that was not removed in harvested crops or by volatilization was discharged in the groundwater. Applications of manure and fertilizer nitrogen to 47.5 acres of cropped fields decreased about 33 percent, from an average of 22,700 pounds per year (480 pounds per acre per year) before nutrient management to 15,175 pounds of nitrogen per year (320 pounds per acre per year) after the implementation of nutrient management practices. Nitrogen loads in ground-water discharged from the site decreased about 30 percent, from an average of 292 pounds of nitrogen per million gallons of ground water before nutrient management to an average of 203 pounds of nitrogen per million gallons as a result of the decreased manure and commercial fertilizer applications. Reductions in manure and commercial fertilizer applications caused a reduction of approximately 11,000 pounds (3,760 pounds per year; 70 pounds per acre per year) in the load of nitrogen discharged in ground water from the 55-acre site during the three-year period 1987-1990.

Study ID	**201300516101**	**Study Area**	**Lancaster County**	Area (ha)	22.25	Tillage	Not Specified	Cover Crop	None
Practice ID	241	Practice Name	PreBMP	General Practice		Control		Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-CN-CEX-EN			
Irrigation	Yes	Irrig. Descrip.	N/A (rainfall)						
Soils	Hagerstown and Duffield series silt loams and silt-clay loams								
Fertilizer	Inputs of nitrogen to the site were manure fertilizer from cattle, swine, and poultry and commercial fertilizer								
Comments	The crops grown in this watershed included corn, tobacco, rye, sudangrass, fruits and vegetables. The median slope was 5%. The pre-BMP period was 1985-86; post-BMP was 1988-90. Nutrient management was the BMP.								

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Crop	1	Corn	Yield	-999999	NA
Crop	2	Tobacco	Yield	-999999	NA
Crop	3	Rye	Yield	-999999	NA
Crop	4	Corn	Yield	-999999	NA
Crop	5	Tobacco	Yield	-999999	NA
Crop	6	Rye	Yield	-999999	NA

Study ID	**201300516102**	**Study Area**	**Lancaster County**	Area (ha)	22.25	Tillage	Not Specified	Cover Crop	None
Practice ID	242	Practice Name	PostBMP	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NM-CCN-CN-CEX-EN			
Irrigation	Yes	Irrig. Descrip.	N/A (rainfall)						
Soils	Hagerstown and Duffield series silt loams and silt-clay loams								
Fertilizer									
Comments	The crops grown in this watershed included corn, tobacco, rye, sudangrass, fruits and vegetables. The median slope was 5%. The pre-BMP period was 1985-86; post-BMP was 1988-90. Nutrient management was the BMP.								

Crop	7	Corn	Yield	-999999	NA
Crop	8	Tobacco	Yield	-999999	NA
Crop	9	Sudan Grass	Yield	-999999	NA
Crop	10	Corn	Yield	-999999	NA
Crop	11	Tobacco	Yield	-999999	NA
Crop	12	Fruit and Vegetables	Yield	-999999	NA
Crop	13	Corn	Yield	-999999	NA
Crop	14	Tobacco	Yield	-999999	NA
Crop	15	Fruit and Vegetables	Yield	-999999	NA
Crop	16	Corn	Yield	-999999	NA
Crop	17	Tobacco	Yield	-999999	NA
Crop	18	Fruit and Vegetables	Yield	-999999	NA

Test Site ID	Test Site Name
2013007055	**Harmel et al. 2004a**

Location	Riesel	McLennan	TX	US
Study Citation	2004			
	Harmel, R.D., H.A. Torbert, B.E. Haggard, R. Haney, and M. Dozier.			
	Water Quality Impacts of Converting to a Poultry Litter Fertilization Strategy			
	J. Environ. Qual. 33:2229-2242			
NRCS LRR	Southwestern Prairies Cotton and Forage Region			
NRCS MLRA	Texas Blackland Prairie, Southern Part			
HUC_10	1207010101	Test Site Scale	Field	
Experimental Design Type/ Description	Multiple Treatments w/ Controls, No Replication			
Crops	Corn, Grass, Grazing			
Study Duration	3 years			

Summary

Because of precision application technology, variable rate fertilizer application based on within-field heterogeneity has the potential to decrease negative water quality impacts. Therefore, the objective of this paired watershed study was to evaluate the impact of variable rate nitrogen (N) fertilizer application on surface water quality. The variable rate (VR) field was divided into management units designated as poor, moderate, and high based on measured yield potential and received 100–160 kg/ha of N fertilizer. A portion of the N application was uniformly applied pre-plant or at planting, and rest was sidedressed at variable rates. The uniform rate (UR) field received uniform N application at 135 kg/ha. Surface water runoff and water quality were monitored for each field, and collected samples were analyzed for N and phosphorus (P) constituents. During the 2-year monitoring period with 22 storm sampling events, variable rate N application resulted in few water quality differences compared to uniform rate application, but overall median NO3 + NO2–N concentrations were significantly lower for the variable rate field in the second year of variable rate N application. Overall and event mean NO3 + NO2–N concentrations from the variable rate field tended to be higher, but median concentrations from the uniform rate field tended to be higher.

Study ID	**201300705501**	**Study Area**	**W12**	Area (ha)	4.00	Tillage	Conventional	Cover Crop	
Practice ID	1	Practice Name	W12	General Practice		Fertilizer		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	9 Mg/ha poultry litter								
Comments	Imported from MANAGE 2013; practices include: Conservation, Waterway, Terrace, Contour Farming.								

Crop	Yield

Study ID	**201300705502**	**Study Area**	**W13**	Area (ha)	4.60	Tillage	Conventional	Cover Crop	None
Practice ID	2	Practice Name	W13	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	4.5 Mg/ha Poultry litter. In 2001-02, a 3-year crop rotation (corn-corn-wheat) was initiated with each field receiving a constant annual litter application rate. In the corn years, target available N rates were set at approximately 170 kg/ha based on production recommendations by Gass. It was assumed that the litter N available in the first year following application increased from 40% initially to 50% in 2004-2008 as soil microbial communities were enhanced. It was also assumed that 5-10% of littler N was available in the second year following application. Supplemental N was applied prior to planting if needed to reach the 170 kg/ha N target. In the wheat years, no supplemental N was added because litter supplied adequate N for what production (>67 kg available N/ha).								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: Conservation, Waterway, Terrace, Contour Farming.								

Crop	1	Corn	Yield	-999999	NA
Crop	2	Corn	Yield	-999999	NA

Study ID	**201300705503**	**Study Area**	**Y6**	Area (ha)	6.60	Tillage	Conventional	Cover Crop	None
Practice ID	3	Practice Name	Y6	General Practice	Control-Crop			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	Inorganic P, no poultry litter. The cropland control field received only inorganic N and P at rates of 170 kg N/ha and 14 kg P/ha in corn years and at 80 kg N/ha and 17 kg P/ha in wheat years.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: Conservation, Waterway, Terrace, Contour Farming.								

Crop	3	Corn	Yield	-999999	NA

Study ID	**201300705504**	**Study Area**	**Y10**	Area (ha)	7.50	Tillage	Conventional	Cover Crop	None
Practice ID	4	Practice Name	Y10	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	6.7 Mg/ha poultry litter. In 2001-02, a 3-year crop rotation (corn-corn-wheat) was initiated with each field receiving a constant annual litter application rate. In the corn years, target available N rates were set at approximately 170 kg/ha based on production recommendations by Gass. It was assumed that the litter N available in the first year following application increased from 40% initially to 50% in 2004-2008 as soil microbial communities were enhanced. It was also assumed that 5-10% of littler N was available in the second year following application. Supplemental N was applied prior to planting if needed to reach the 170 kg/ha N target. In the wheat years, no supplemental N was added because litter supplied adequate N for what production (>67 kg available N/ha).								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: Conservation, Waterway, Terrace, Contour Farming.								

Crop 4 Corn Yield -999999 NA

Study ID	**201300705505**	**Study Area**	**Y8**	Area (ha)	8.40	Tillage	Conventional	Cover Crop	None
Practice ID	5	Practice Name	Y8	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	13.4 Mg/ha poultry litter. In 2001-02, a 3-year crop rotation (corn-corn-wheat) was initiated with each field receiving a constant annual litter application rate. In the corn years, target available N rates were set at approximately 170 kg/ha based on production recommendations by Gass. It was assumed that the litter N available in the first year following application increased from 40% initially to 50% in 2004-2008 as soil microbial communities were enhanced. It was also assumed that 5-10% of littler N was available in the second year following application. Supplemental N was applied prior to planting if needed to reach the 170 kg/ha N target. In the wheat years, no supplemental N was added because litter supplied adequate N for what production (>67 kg available N/ha).								
Comments	Imported from MANAGE 2013; practices include: Conservation, Waterway, Terrace, Contour Farming.								

Crop 5 Corn Yield -999999 NA

Study ID	**201300705506**	**Study Area**	**Y13**	Area (ha)	4.60	Tillage	Conventional	Cover Crop	None
Practice ID	6	Practice Name	Y13	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	4.6 Mg/ha poutry litter. In 2001-02, a 3-year crop rotation (corn-corn-wheat) was initiated with each field receiving a constant annual litter application rate. In the corn years, target available N rates were set at approximately 170 kg/ha based on production recommendations by Gass. It was assumed that the litter N available in the first year following application increased from 40% initially to 50% in 2004-2008 as soil microbial communities were enhanced. It was also assumed that 5-10% of littler N was available in the second year following application. Supplemental N was applied prior to planting if needed to reach the 170 kg/ha N target. In the wheat years, no supplemental N was added because litter supplied adequate N for what production (>67 kg available N/ha).								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: Conservation, Waterway, Terrace, Contour Farming.								

Crop	6	Corn	Yield	-999999	NA

Study ID	**201300705507**	**Study Area**	**SW12**	Area (ha)	1.20	Tillage	None	Cover Crop	None
Practice ID	7	Practice Name	SW12 Pasture	General Practice	Control-Pasture			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	0 Mg/ha poultry litter. Received no litter since acted as control								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	7	Native Prairie	Yield	-999999	NA

Study ID	**201300705508**	**Study Area**	**SW17**	Area (ha)	1.20	Tillage	None	Cover Crop	None
Practice ID	8	Practice Name	SW17 Pasture	General Practice	Control-Pasture			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	0 Mg/ha poutry litter. Received no litter since acted as control. The grazed pasture watershed (SW17) was opened for selective grazing at rates from 0.4-0.8 ha/cow for about eight months per year.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	8	Coastal Bermudagrass (Grazing)	Yield	-999999	NA

Study ID	**201300705509**	**Study Area**	**Y14**	Area (ha)	2.30	Tillage	None	Cover Crop	None
Practice ID	9	Practice Name	Y14 Pasture	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	13.4. Mg/ha poultry litter. No fertilizer was applied to any of the pasture fields in 2000-01, but a consistent litter application rate was applied to Y14 and W10 in the late summer each year from 2001-08. For the pasture watersheds, no supplemental inorganic N or P was applied.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop 9 Kleingrass Yield -999999 NA

Study ID	**201300705510**	**Study Area**	**W10**	Area (ha)	8.00	Tillage	None	Cover Crop	None
Practice ID	10	Practice Name	W10 Pasture	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black								
Fertilizer	6.7 Mg/ha poutry litter. No fertilizer was applied to any of the pasture fields in 2000-01, but a consistent litter application rate was applied to Y14 and W10 in the late summer each year from 2001-08. For the pasture watersheds, no supplemental inorganic N or P was applied.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop 10 Coastal Bermudagrass Yield -999999 NA

Test Site ID	Test Site Name
2013007062	**Harmel et al. 2004b**

Location	Temple	Bell	TX	US
Study Citation	2004			
	Harmel, R.D., H.A. Torbert, A.L. Kenimer, and S.W. Searcy.			
	Runoff Water Quality Impact of Variable Rate Sidedress Nitrogen Application			
	Precision Agric. 5: 247-261.			
NRCS LRR	Southwestern Prairies Cotton and Forage Region			
NRCS MLRA	Texas Blackland Prairie, Southern Part			
HUC_10	1207020401	Test Site Scale	Field	
Experimental Design Type/ Description	Multiple Treatments, No Control, No Replication			
Crops	Corn			
Study Duration	2 years			

Summary

Because of precision application technology, variable rate fertilizer application based on within-field heterogeneity has the potential to decrease negative water quality impacts. Therefore, the objective of this paired watershed study was to evaluate the impact of variable rate nitrogen (N) fertilizer application on surface water quality. The variable rate (VR) field was divided into management units designated as poor, moderate, and high based on measured yield potential and received 100–160 kg/ha of N fertilizer. A portion of the N application was uniformly applied pre-plant or at planting, and rest was sidedressed at variable rates. The uniform rate (UR) field received uniform N application at 135 kg/ha. Surface water runoff and water quality were monitored for each field, and collected samples were analyzed for N and phosphorus (P) constituents. During the 2-year monitoring period with 22 storm sampling events, variable rate N application resulted in few water quality differences compared to uniform rate application, but overall median NO3 + NO2–N concentrations were significantly lower for the variable rate field in the second year of variable rate N application. Overall and event mean NO3 + NO2–N concentrations from the variable rate field tended to be higher, but median concentrations from the uniform rate field tended to be higher.

Study ID	**201300706201**	**Study Area**	**Uniform Rate Field**	Area (ha)	5.70	Tillage	Not specified	Cover Crop	None
Practice ID	1	Practice Name	Uniform Rate Field Cons Till	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black, Ferris, Heiden								
Fertilizer	2/9/00 - Surface applied 64 kg/ha N and 39 kg/ha P as mixture of liquid 32-0-0 and 11-37-004/26/00 - Knifed in 71 kg/ha N as liquid 32-0-0								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: Conservation, Terrace, Waterway.								

Crop	1	Corn (No Winter Cover Crop)	Yield	7.9 Mg/ha
Crop	2	Corn (No Winter Cover Crop)	Yield	5.4 Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300706202**	**Study Area**	**Variable Rate Field**	Area (ha)	9.10	Tillage	Not specified	Cover Crop	None
Practice ID	2	Practice Name	Variable Rate Field Cons Till	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clay- Houston Black, Ferris, Heiden								
Fertilizer	2/26/99 - surface applied 83 kg/ha N as liquid 32-0-03/2/99 - Knifed in 12 kg/ha N and 39 kg/ha P as mixture of liquid 32-0-0 and 11-37-0 at planting4/17/99 - knifed in variable rate N (13, 37, 60 kg/ha) as liquid 32-0-0								
Comments	Imported from MANAGE 2013; additional meta data added in 2015. MANAGE identified practices include: Conservation, Terrace, Waterway.								

Crop	1	Corn (No Winter Cover Crop)	Yield	7.7 Mg/ha
Crop	2	Corn (No Winter Cover Crop)	Yield	5.5 Mg/ha

Test Site ID	Test Site Name
2016001011	**Huggins et al. 2001**

Location		Redwood	MN	US
Study Citation	2001			
	Huggins, D.R., Randall G.W., Russelle, M.P.			
	Subsurface Drain Losses of Water and Nitrate following Conversion of Perennials to Row Crops			
	Agronomy Journal			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0702000806	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	Randomized complete block design with three replications			
Crops	Corn-Soybean			
Study Duration	3 years			

Summary

Authors evaluated water and N use efficiency of row crops following perennials, and losses of water and NO3–N to subsurface drains. Four cropping systems: continuous corn (Zea mays L.), a corn–soybean [Glycine max (L.) Merr.] rotation, alfalfa (ALF), and CRP, were established in 1988. The ALF and CRP were converted to a corn–corn–soybean sequence from 1994 through 1996 while continuous corn (C-C) and corn–soybean (C-S) rotations were maintained. High N uptake efficiencies of corn following alfalfa slowed the buildup of residual soil NO3–N, but levels were equal to row crop systems after 2 yr. Nitrate losses in drainage water remained low during the initial year of conversion, but were similar to row crop systems during the subsequent 2 yr. Beneficial effects of perennials on subsurface drainage characteristics were largely negated following 1 to 2 years of corn.

Study ID	**201600101101**	**Study Area**	**Corn-Corn**	Area (ha)	0.02	Tillage	Moldboard plow	Cover Crop	None
Practice ID	1	Practice Name	Corn-Corn	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cropping Systems	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania clay loam (fine-loamy, mixed, mesic Aquic Haplustolls)								
Fertilizer									
Comments									

Crop	1	Corn	Yield	3524.410374	kg/acre
Crop	2	Corn	Yield	2311.971118	kg/acre
Crop	3	Corn	Yield	2660.001078	kg/acre

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201600101102**	**Study Area**	**Corn-Soy**	Area (ha)	0.02	Tillage	Moldboard plow, no till	Cover Crop	None
Practice ID	2	Practice Name	Corn-Soy	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cropping Systems	Practice Overview	NM-CCN-CN-CS-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania clay loam (fine-loamy, mixed, mesic Aquic Haplustolls)								
Fertilizer									
Comments									

Crop	4	Corn	Yield	3693.164436	kg/acre
Crop	5	Soybean	Yield	2853.0363	kg/acre
Crop	6	Corn	Yield	2651.907358	kg/acre
Crop	7	Soybean	Yield	1186.539352	kg/acre
Crop	8	Corn	Yield	894.35606	kg/acre
Crop	9	Soybean	Yield	894.35606	kg/acre

Study ID	**201600101103**	**Study Area**	**ALF-C-C-S**	Area (ha)	0.02	Tillage	Moldboard plow, no till	Cover Crop	None
Practice ID	3	Practice Name	ALF-C-C-S	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cropping Systems	Practice Overview	NM-CCN-CN-CSX-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania clay loam (fine-loamy, mixed, mesic Aquic Haplustolls)								
Fertilizer									
Comments									

Crop	10	Corn	Yield	3654.719266	kg/acre
Crop	11	Corn	Yield	2358.914694	kg/acre
Crop	12	Soybean	Yield	1060.682006	kg/acre

Study ID	**201600101104**	**Study Area**	**CRP-C-C-S**	Area (ha)	0.02	Tillage	Moldboard plow, no till	Cover Crop	None
Practice ID	4	Practice Name	CRP-C-C-S	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Cropping Systems	Practice Overview	NM-CCN-CN-CSX-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania clay loam (fine-loamy, mixed, mesic Aquic Haplustolls)								
Fertilizer									
Comments									

Crop	13	Corn	Yield	3798.382796	kg/acre
Crop	14	Corn	Yield	2872.056542	kg/acre
Crop	15	Soybean	Yield	1064.32418	kg/acre

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013001004	**IDRA Farm**

Location		Quebec	XX	CA

Study Citation	2010
	Caron, E., P. Lafrance, J. Auclair, and M. Duchemin
	Impact of Grass and Grass with Poplar Buffer Strips on Atrazine and Metolachlor Losses in Surface Runoff and Subsurface Infiltration from Agricultural Plots
NRCS LRR	Canada
NRCS MLRA	Canada
HUC_10	-999999 Test Site Scale Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	plot study: complete randomized block Study objective: to compare the impact of grass and grass+tree buffer strips on the exported masses of dissolved atrazine, metolachlor, and desethylatrazine (DEA) in runoff and subsurface infiltration water (infiltration water under the buffer zones). Monitoring of herbicide losses by infiltration just below the buffer zones, along with runoff, allows for an estimate of their respective contributions. The unique experimental design allows for the specific study under natural rainfall of the distribution (runoff versus subsurface infiltration) of exported masses of dissolved herbicides under those buffers zones. A second objective of this 2-yr study was to account for the possible variability of meteorological conditions that determine the flow distribution in the field. The distribution between surface runoff and subsurface infiltration under those two kinds of buffer strips is expected to have an impact on herbicide attenuation and on total herbicide losses toward surface water.
Crops	Corn
Study Duration	2 years

Summary

In many areas of intensive corn production, atrazine and metolachlor are among the most commonly found herbicides in surface and groundwater. This 2-yr study compared the impact of grass and grass+tree buffer strips on the exported masses of atrazine, metolachlor, and a degradation product of atrazine, desethylatrazine (DEA). The experimental system consisted of four replicate plots in a three-way completely randomized design (no buffer zone, grass buffer zone, and grass+tree buffer strips). The field plots were 5 m wide and 30 m long and grown in corn. The grass and grass+tree buffer strips were 5 m and had the same grass vegetation except for eight young hybrid poplars. Over the 2-yr study, surface runoff and subsurface infiltration water (under the buffer strip) were collected after the initial three rainfall events after herbicide application. Dissolved atrazine, metolachlor, and DEA were analyzed by gas chromatography/mass spectrometry. The presence of buffer strips decreased the exported masses of atrazine and metolachlor in surface runoff . A three-way ANOVA with treatment (type of buffer strip), water (surface runoff or subsurface infiltration), and time between herbicide application and rainfall event as factors showed a significant reduction (40–60% in 2004 and 75–95% in 2005) in the total (surface runoff +infiltrated water) exported masses of atrazine and metolachlor in the presence of buffer strips. Rainfall events after herbicide application were different between the 2 yr and greatly affected the flow distribution (e.g., subsurface infiltration) and the leached herbicide concentrations. No significant difference in the capacity to reduce herbicide exports was observed between grass and grass+tree buffer strip treatments; the poorly developed young poplar biomass at the time of the study may partly explain this observation.

Study ID	**201300100401**	**Study Area**	**Field Plot - Control**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	None
Practice ID	1	Practice Name	Control	General Practice		Control		Area Type	C
Category	Structural	Study Focus	Buffer	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	The surface horizon (Ap, 0–15 cm) is a silty-clay loam with an organic matter content of 3.4%. The A horizon is 29 cm deep, the B horizon is 30 to 68 cm deep, and the C horizon is 69 to 115 cm deep. The bulk density of the horizons varies from 1.25 for th								
Fertilizer	The experimental plots were fertilized with liquid swine manure using the typical application rate of 40 t/ha recommended for the Chaudière-Appalaches region on 31 May 2004 and on 25 May 2005, when the corn reached the three- or four leaf stage.								
Comments	The grass composition of the buffer zones was 45% red fescue, 45% white redtop, and 10% ryegrass. The grass + tree buffer zone had eight hybrid poplars in addition to the grass species. area ratio source/strip was 6.0								

Crop	1	corn (Zea mays L.)	Yield	-999999	NA
Crop	4	corn (Zea mays L.)	Yield	-999999	NA

Study ID	**201300100402**	**Study Area**	**Field Plot - Grass**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	None
Practice ID	2	Practice Name	Grass	General Practice		Filter Strip		Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview		NC-CCN-CN-CO-EB			
Irrigation	No	Irrig. Descrip.							
Soils	The surface horizon (Ap, 0–15 cm) is a silty-clay loam with an organic matter content of 3.4%. The A horizon is 29 cm deep, the B horizon is 30 to 68 cm deep, and the C horizon is 69 to 115 cm deep. The bulk density of the horizons varies from 1.25 for th								
Fertilizer	The experimental plots were fertilized with liquid swine manure using the typical application rate of 40 t/ha recommended for the Chaudière-Appalaches region on 31 May 2004 and on 25 May 2005, when the corn reached the three- or four leaf stage.								
Comments	The grass composition of the buffer zones was 45% red fescue, 45% white redtop, and 10% ryegrass. The grass + tree buffer zone had eight hybrid poplars in addition to the grass species. area ratio source/strip was 6.0								

Crop	2	corn (Zea mays L.)	Yield	-999999	NA
Crop	5	corn (Zea mays L.)	Yield	-999999	NA

Study ID	**201300100403**	**Study Area**	**Field Plot - Grass+Tree**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	None
Practice ID	3	Practice Name	Grass+Tree	General Practice	Filter Strip			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CO-EB				
Irrigation	No	Irrig. Descrip.							
Soils	The surface horizon (Ap, 0–15 cm) is a silty-clay loam with an organic matter content of 3.4%. The A horizon is 29 cm deep, the B horizon is 30 to 68 cm deep, and the C horizon is 69 to 115 cm deep. The bulk density of the horizons varies from 1.25 for th								
Fertilizer	The experimental plots were fertilized with liquid swine manure using the typical application rate of 40 t/ha recommended for the Chaudière-Appalaches region on 31 May 2004 and on 25 May 2005, when the corn reached the three- or four leaf stage.								
Comments	The grass composition of the buffer zones was 45% red fescue, 45% white redtop, and 10% ryegrass. The grass + tree buffer zone had eight hybrid poplars in addition to the grass species. area ratio source/strip was 6.0								

Crop	3	corn (Zea mays L.)	Yield	-999999	NA
Crop	6	corn (Zea mays L.)	Yield	-999999	NA

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2016001008	**Jaynes et al. 2001**

Location			IA	US
Study Citation	2001			
	Jaynes, D.B., Colvin, T.S., Karlen, D.L., Cabardella, C.A., Meek, D.W.			
	Nitrate Loss in Subsurface Drainage as Affected by Nitrogen Fertilizer Rate			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA				
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
Crops	Corn-Soybean			
Study Duration	4 years			

Summary

From 1996 through 1999, the authors measured yield and NO3 loss from a subsurface drained field in central Iowa at three N fertilizer rates: a low (L) rate, a medium (M) rate, and a high (H) rate. Corn (Zea mays L.) and soybean [Glycine max (L.) Merr.] were grown in rotation with fertilizer applied in the spring to corn only. For the L treatment, NO3 concentrations in the drainage water exceeded the 10 mg N/L maximum contaminant level (MCL) established by the USEPA for drinking water only during the years that corn was grown. For the M and H treatments, NO3 concentrations exceeded the MCL in all years, regardless of crop grown.

Study ID	**201600100801**	**Study Area**	**Low**	Area (ha)	-99.00	Tillage	Chisel plow, Moldboard	Cover Crop	None
Practice ID	1	Practice Name	Low	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NM-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Primarily Kossuth-Ottosen association (288-388), and small areas of Harps (95) and Okoboji (6)								
Fertilizer									
Comments									

Crop	1	Corn	Yield
Crop	2	Soybean	Yield
Crop	3	Corn	Yield
Crop	4	Soybean	Yield

Study ID	**201600100802**	**Study Area**	**Med**	Area (ha)	-99.00	Tillage	Chisel plow, Moldboard	Cover Crop	None
Practice ID	2	Practice Name	Med	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NM-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Primarily Kossuth-Ottosen association (288-388), and small areas of Harps (95) and Okoboji (6)								
Fertilizer									
Comments									

Crop	5	Corn	Yield
Crop	6	Soybean	Yield
Crop	7	Corn	Yield
Crop	8	Soybean	Yield

Study ID	**201600100803**	**Study Area**	**High**	Area (ha)	-99.00	Tillage	Chisel plow, Moldboard	Cover Crop	None
Practice ID	3	Practice Name	High	General Practice		Control		Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Primarily Kossuth-Ottosen association (288-388), and small areas of Harps (95) and Okoboji (6)								
Fertilizer									
Comments									

Crop	9	Corn	Yield
Crop	10	Soybean	Yield
Crop	11	Corn	Yield
Crop	12	Soybean	Yield

Test Site ID	Test Site Name
2016001009	Jaynes et al. 2008

Location		Boone	IA	US
Study Citation	2008			
	Jaynes, D.B., Kaspar, T.C., Moorman, T.B., Parkin, T.B.			
	In Situ Bioreactors and Deep Drain-Pipe Installation to Reduce Nitrate Losses in Artificially Drained Fields			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0708010503	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	Randomized complete block design with four replications			
Crops	Corn-Soybeans			
Study Duration	6 years			

Summary

Authors compared the NO3 losses in tile drainage from a conventional drainage system (CN) from two alternative drainage designs--a deep tile (DT), where the tile drain was installed 0.6 m deeper than the conventional tile depth, but with the outlet maintained at 1.2 m, and a denitrification wall (DW), where trenches excavated parallel to the tile and filled with woodchips serve as additional carbon sources to increase denitrification. Over 5 years the tile flow from the DW treatment had annual average NO3 concentrations significantly lower than the CN treatment. The DT treatment did not consistently lower NO3 concentrations, nor reduce the annual NO3 mass loss in drainage.

Study ID	**201600100901**	**Study Area**	**CN**	Area (ha)	0.13	Tillage	Disked, No-till	Cover Crop	None
Practice ID	1	Practice Name	CN	General Practice		Control		Area Type	C
Category	Management	Study Focus	Bioreactor, Controlled Drainage	Practice Overview		NM-CCN-NT-CS-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo silty clay loam and Nicollet loam								
Fertilizer									
Comments									

Crop	1	Corn	Yield		
Crop	2	Soybean	Yield	3	Mg/ha
Crop	3	Corn	Yield	12.4	Mg/ha
Crop	4	Soybean	Yield	2.7	Mg/ha
Crop	5	Corn	Yield	13.3	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Crop	6	Soybean		Yield	4.5	Mg/ha			
Study ID	**201600100902**	**Study Area**	**DT**	Area (ha)	0.13	Tillage	Disked, No-till	Cover Crop	None
Practice ID	2	Practice Name	DT	General Practice		Drainage Water Management		Area Type	T
Category	Management	Study Focus	Bioreactor, Controlled Drainage	Practice Overview		NM-CCN-NT-CS-ED			
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo silty clay loam and Nicollet loam								
Fertilizer									
Comments									
Crop	7	Corn		Yield					
Crop	8	Soybean		Yield	3	Mg/ha			
Crop	9	Corn		Yield	11.8	Mg/ha			
Crop	10	Soybean		Yield	2.6	Mg/ha			
Crop	11	Corn		Yield	13.5	Mg/ha			
Crop	12	Soybean		Yield	4.1	Mg/ha			
Study ID	**201600100903**	**Study Area**	**DW**	Area (ha)	0.13	Tillage	Disked, No-till	Cover Crop	None
Practice ID	3	Practice Name	DW	General Practice		Bioreactor		Area Type	T
Category	Structural	Study Focus	Bioreactor, Controlled Drainage	Practice Overview		NM-CCN-NT-CS-EO			
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo silty clay loam and Nicollet loam								
Fertilizer									
Comments									
Crop	13	Corn		Yield					
Crop	14	Soybean		Yield	2.9	Mg/ha			
Crop	15	Corn		Yield	11.7	Mg/ha			
Crop	16	Soybean		Yield	2.5	Mg/ha			
Crop	17	Corn		Yield	13.3	Mg/ha			

Crop	18	Soybean	Yield

Test Site ID	Test Site Name
2013005202	**Jordan, T. E., 1993**

Location	Centreville	Queen Anne's	MD	US

Study Citation	1993
	Jordan, T. E., D. L. Correll and D. E. Weller.
	Nutrient interception by a riparian forest receiving inputs from adjacent cropland.
	J. Environ. Qual. 22:467-473.
NRCS LRR	Atlantic and Gulf Coast Lowland Forest and Crop Region
NRCS MLRA	Atlantic Coast Flatwoods
HUC_10	0206000204
Test Site Scale	Field
Experimental Design Type/ Description	Inflow-Outflow
	To investigate the ability of riparian forest to intercept nutrients leaving adjacent cropland, examined changes in the chemistry of groundwater flowing from a corn field through a riparian forest.
Crops	Corn
Study Duration	1 year

Summary

To investigate the ability of riparian forest to intercept nutrients leaving adjacent cropland, the authors examined changes in the chemistry of groundwater flowing from a corn (Zea mays L.) field through a riparian forest. This study provided a comparison to previous studies of a different forest. The authors sampled groundwater from a transect of wells, and used a Br- tracer to confirm that groundwater moved laterally along the transect through the forest. As groundwater flowed through the forest, NO3- concentrations decreased from about 8 mg/L at the edge of the corn field to <0.4 mg/L halfway through the forest. Dissolved organic N and NH4+ increased by less than 0.1 mg/L, and dissolved organic C did not change with distance. Sulfate remained constant with distance until midway through the forest, where it began to increase. Chloride concentration rose until midway through the forest, then fell, Values of pH increased from under 5 at the edge of the corn field to over 7 at the stream bank, perhaps as a result of the NO3- consumption. Most of the change in NO3- occurred abruptly at the edge of a floodplain within the forest. There the water table was closest to the surface and soil Eh below the water table was less than -90 mV. Such strongly reducing conditions may have promoted denitrification in the floodplain. In contrast, soil Eh on the adjacent hill slope was above 500 mV, to high to support denitrification. There were only slight seasonal changes in groundwater chemistry. The authors also studied the net annual accretion of sediment in the riparian forest by measuring changes in the elevation of the soil surface. There was little or no accretion in the forest, but along a path of overland storm flow there was net erosion. Thus, nutrient retention by this forest, in contrast with the previously studied forest, was entirely a below ground process. Functional differences within sections of this forest and among different riparian forests suggest a need for research on the factors that control nutrient retention.

Study ID	**201300520201**	**Study Area**	**Centerville**	Area (ha)	-99.00	Tillage	No Till	Cover Crop	None
Practice ID	248	Practice Name	Buffer	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-NT-CO-EB				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Pensauken sediments, feldspathic sand, gravelly at the bottom just above the clayey sediments of the Chesapeake Group								
Fertilizer									
Comments	This study estimated that riparian forest buffers remove approx. 60 kg NO3N/ha-yr from groundwater. The area above the buffer was in a no-till corn/soybean rotation. The buffer was 60 meters wide.								

Crop	1	corn	Yield	-999999	NA

Test Site ID	Test Site Name
2013005545	Kaluli, J. W., 1999

Location		Quebec (Soulanges)	XX	CA
Study Citation	1999			
	Kaluli, J. W., C. A. Madramootoo, X. Z. Zhou, A. F. MacKenzie and D. L. Smith.			
	Subirrigation systems to minimize nitrate leaching.			
	J. Irrig. Drain. Eng. 125(2):52-58.			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	plot study: complete randomized block			
Crops	Corn, grass			
Study Duration	2 years			

Summary

In field plots 75 m long by 15 m wide, the authors tested the hypothesis that subirrigation and intercropping will reduce nitrate leaching losses from cultivated corn and minimize water pollution. Nitrate leaching under subirrigation at a depth of either 0.7 m or 0.8 m below the soil surface was compared with leaching under free drainage. The cropping systems investigated were corn (Zea mays L.) monoculture and corn intercropped with annual Italian ryegrass (Lolium multiflorum Lam. cv. Barmultra). The effects of three fertilizer application rates (0, 180, and 270 kg N ha-1) on leaching were investigated in the freely drained plots. The greatest annual loss of NO3--N in tile drainage water (21.9 kg N ha-1) occurred in freely draining, monocropped plots fertilized with 270 kg N ha-1. Monocropped plots fertilized with 270 kg N ha-1, with subirrigation at 0.7 m depth, resulted in annual nitrate losses into tile drainage of 6.6 kg N ha-1, 70% less than under free drainage. Annual soil denitrification rates (60 kg N ha-1) with subirrigation at 0.7 m were about three-fold greater than under free drainage. Intercropping under free drainage resulted in a 50% reduction in tile drainage loss of NO3--N compared with monocropping. Off-season (November 1, 1993, to May 31, 1994) tile drainage losses of NO3--N (7.8 kg N ha-1) from freely draining monocropped plots accounted for 30% of the annual tile drainage losses.

Study ID	**201300554501**	**Study Area**	**F1.0MN0**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	None
Practice ID	1	Practice Name	F1.0MN0	General Practice	Control			Area Type	C
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.	Not irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots to receive no N, phosphorus was supplied as triple superphosphate.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Monocropped corn	Yield	-999999
Crop	2	Monocropped corn	Yield	-999999

Study ID	**201300554502**	**Study Area**	**F1.0MN180**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	None
Practice ID	2	Practice Name	F1.0MN180	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NM-CCN-CN-CO-ED				
Irrigation	No	Irrig. Descrip.	Not irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 133 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Monocropped corn	Yield	-999999
Crop	2	Monocropped corn	Yield	-999999

Study ID	**201300554503**	**Study Area**	**F1.0MN270**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	None
Practice ID	3	Practice Name	F1.0MN270	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NC-CCN-CN-CO-ED				
Irrigation	No	Irrig. Descrip.	Not irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 233 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Monocropped corn	Yield	-999999
Crop	2	Monocropped corn	Yield	-999999

Study ID	**201300554504**	**Study Area**	**F1.0IN270**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	annual Italian ryegrass (Lolium multiflorum Lam. cv. Barmultra)
Practice ID	4	Practice Name	F1.0IN270	General Practice	Nutrient Management, Cover Crop	Area Type	T		
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NC-CCY-CN-CO-ED				
Irrigation	No	Irrig. Descrip.	Not irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 233 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Intercropped corn	Yield	-999999
Crop	2	Ryegrass	Yield	-999999
Crop	3	Intercropped corn	Yield	-999999
Crop	4	Ryegrass	Yield	-999999

Study ID	**201300554505**	**Study Area**	**S0.8MN270**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	None
Practice ID	5	Practice Name	S0.8MN270	General Practice	Drainage Water Management, Nutrient Management	Area Type	T		
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NC-CCN-CN-CO-ED				
Irrigation	Yes	Irrig. Descrip.	Sub-irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 233 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Monocropped corn	Yield	-999999

Crop	2	Monocropped corn		Yield	-999999				
Study ID	**201300554506**	**Study Area**	**S0.8IN270**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	annual Italian ryegrass (Lolium multiflorum Lam. cv. Barmultra)
Practice ID	6	Practice Name	S0.8IN270	General Practice	Drainage Water Management, Cover Crop, Nutrient Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NC-CCY-CN-CO-ED				
Irrigation	Yes	Irrig. Descrip.	Sub-irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 233 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								
Crop	1	Intercropped corn		Yield	-999999				
Crop	2	Ryegrass		Yield	-999999				
Crop	3	Intercropped corn		Yield	-999999				
Crop	4	Ryegrass		Yield	-999999				

Study ID	**201300554507**	**Study Area**	**S0.7MN270**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	None
Practice ID	7	Practice Name	S0.7MN270	General Practice	Drainage Water Management, Nutrient Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NC-CCN-CN-CO-ED				
Irrigation	Yes	Irrig. Descrip.	Sub-irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 233 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Monocropped corn	Yield	-999999
Crop	2	Monocropped corn	Yield	-999999

Study ID	**201300554508**	**Study Area**	**S0.7IN270**	Area (ha)	0.11	Tillage	Not specified	Cover Crop	annual Italian ryegrass (Lolium multiflorum Lam. cv. Barmultra)
Practice ID	8	Practice Name	S0.7IN270	General Practice	Drainage Water Management, Cover Crop, Nutrient Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage, Fertilizer, Cover Crop	Practice Overview	NC-CCY-CN-CO-ED				
Irrigation	Yes	Irrig. Descrip.	Sub-irrigated						
Soils	Soulanges sandy loam (fine, silty, mixed, nonacid, frigid Humaquept)								
Fertilizer	At planting, all plots received 141 kg K/ha (supplied as K20) and 52 kg P/ha, based on prior soil testing. In plots designed to receive N fertilizer, the P was supplied as ammonium phosphate (18-46-0), thus also providing 47 kg N/ha. 233 kg N/ha was applied broadcast as ammonium nitrate (34-0-0) two weeks after planting.								
Comments	This study investigated 3 drainage methods, 3 fertilization levels, and 2 cropping systems using 24 plots, each 75-m x 15-m in size. Drainage effluent was collected in tiles where flow and pollutants were monitored.								

Crop	1	Intercropped corn	Yield	-999999
Crop	2	Ryegrass	Yield	-999999

Crop	3	Intercropped corn	Yield	-999999
Crop	4	Ryegrass	Yield	-999999

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013005546	**Kanwar, R. S. , 2000**
Location	Nashua, Chickasaw, IA, US
Study Citation	2000
	Kanwar, R. S., A. Bakhsh, C. Pederson, D. L. Karlen, and C. A. Cambardella.
	N-management effects on residual soil nitrate-N, NO3-N concentrations in subsurface drain water, and crop yields.
	Paper No. 00-2204. 2000 ASAE International Meeting. American Society of Agricultural Engineers: St. Joseph, Michigan.
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Till Plains
HUC_10	0708020112
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	plot study with replications
Crops	Corn, soybean
Study Duration	6 years

Summary

Nutrient management systems, for the corn-soybean production system, has the potential to reduce NO3-N leaching to groundwater and increase crop yields. A six year (1993-98) study was conducted to evaluate the effects of late spring soil nitrate test on residual soil NO3-N levels and NO3-N concentrations in subsurface drain water under corn-soybean rotation. The tillage and N management treatments included the use of late spring soil nitrate test and a reduced application of N at a rate of 112 kg/ha to corn frown in rotation with soybeans with either no-till or chisel plowing as the primary tillage practice. Experimental data were collected in Iowa using 24, 0.4 ha plots. Each plot was drained with a single tile drain which was intercepted at the end of the plot for monitoring tile slows and collecting tile water samples for NO3-N analyses. Results of this study clearly show that the use of late spring soil nitrate test and single N application resulted in almost similar six year average NO3-N concentrations in tile water. No-till system with single N application resulted in significantly (P=0.05) higher NO3-N losses with tile water in comparison with the late spring soil nitrate test under both no-till and chisel plow systems.

Study ID	**201300554601**	**Study Area**	**CP-LSNT-corn**	Area (ha)	0.40	Tillage	Chisel plow	Cover Crop	None
Practice ID	759	Practice Name	CP-LSNT-corn	General Practice	Conservation Tillage and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Kenyon silty-clay loam soil with 3 to 4 % organic matter								
Fertilizer	The N fertilizer (UAN, liquid urea-ammonium nitrate solution) was applied in the spring of each year. UAN was applied with the spoke injector but application rates were calculated by using the late spring nitrate test (LSNT). The amount of side-dress nitrogen applied on LSNT treatments was determined by taking sixteen, 1-foot deep soil cores from each plot when corn was at the 6th leaf stage. Nitrogen fertilizer was added, if needed, to increase soil nitrate-N to 25 ppm.								
Comments	This plot study investigated the impacts of late spring soil nitrate tests (LSNT) and no-till (NT) on NPS pollutants and corn yield. Twenty four plots - each 59 x 69m in size (1.0 ac) - were used with two treatments and two controls of 6 replications each. The controls were single N application pre-plant (S) and conventional chisel plow tillage (CP). The N fertilizer was applied using two different N management systems: single N application at a rate of 112 kg/ha as pre-plant; and application rates calculated by using the late spring nitrate test (LSNT). The amount of sidedress N applied on LSNT treatments was determined by taking 16, 1-foot deep soil cores from each plot when corn was at the 6th leaf stage. N fertilizer was added, if needed, to increase soil nitrate-N to 25 ppm. The average amount of N applied to LSNT plots ranged from 93-193 kg N/ha, with the no-till system typically requiring more nitrogen than the chisel plow system. The first year of the study (1993) was extremely wet, receiving 35% more rainfall than in a normal year.								

Crop	1	Corn	Yield	7.7	Mg/ha
Crop	3	Corn	Yield	8.2	Mg/ha
Crop	5	Corn	Yield	6.1	Mg/ha
Crop	7	Corn	Yield	9.2	Mg/ha
Crop	9	Corn	Yield	10.1	Mg/ha
Crop	11	Corn	Yield	10.7	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300554602**	**Study Area**	**CP-S-corn**	Area (ha)	0.40	Tillage	Chisel plow	Cover Crop	None
Practice ID	762	Practice Name	CP-S-corn	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Kenyon silty-clay loam soil with 3 to 4 % organic matter								
Fertilizer	The N fertilizer (UAN, liquid urea-ammonium nitrate solution) was applied in the spring of each year. UAN was applied as a single N application at a rate of 112 kg/ha as pre-plant using a spoke injector.								
Comments	This plot study investigated the impacts of late spring soil nitrate tests (LSNT) and no-till (NT) on NPS pollutants and corn yield. Twenty four plots - each 59 x 69m in size (1.0 ac) - were used with two treatments and two controls of 6 replications each. The controls were single N application pre-plant (S) and conventional chisel plow tillage (CP). The N fertilizer was applied using two different N management systems: single N application at a rate of 112 kg/ha as pre-plant; and application rates calculated by using the late spring nitrate test (LSNT). The amount of sidedress N applied on LSNT treatments was determined by taking 16, 1-foot deep soil cores from each plot when corn was at the 6th leaf stage. N fertilizer was added, if needed, to increase soil nitrate-N to 25 ppm. The average amount of N applied to LSNT plots ranged from 93-193 kg N/ha, with the no-till system typically requiring more nitrogen than the chisel plow system. The first year of the study (1993) was extremely wet, receiving 35% more rainfall than in a normal year.								

Crop	1	Corn	Yield	5.1	Mg/ha
Crop	3	Corn	Yield	7.9	Mg/ha
Crop	5	Corn	Yield	6	Mg/ha
Crop	7	Corn	Yield	8.8	Mg/ha
Crop	9	Corn	Yield	9.8	Mg/ha
Crop	11	Corn	Yield	9.7	Mg/ha

Study ID	**201300554603**	**Study Area**	**NT-LSNT-corn**	Area (ha)	0.40	Tillage	No Till	Cover Crop	None
Practice ID	760	Practice Name	NT-LSNT-corn	General Practice	Conservation Tillage and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-NT-CS-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Kenyon silty-clay loam soil with 3 to 4 % organic matter								
Fertilizer	The N fertilizer (UAN, liquid urea-ammonium nitrate solution) was applied in the spring of each year. UAN was applied with the spoke injector but application rates were calculated by using the late spring nitrate test (LSNT). The amount of side-dress nitrogen applied on LSNT treatments was determined by taking sixteen, 1-foot deep soil cores from each plot when corn was at the 6th leaf stage. Nitrogen fertilizer was added, if needed, to increase soil nitrate-N to 25 ppm.								
Comments	This plot study investigated the impacts of late spring soil nitrate tests (LSNT) and no-till (NT) on NPS pollutants and corn yield. Twenty four plots - each 59 x 69m in size (1.0 ac) - were used with two treatments and two controls of 6 replications each. The controls were single N application pre-plant (S) and conventional chisel plow tillage (CP). The N fertilizer was applied using two different N management systems: single N application at a rate of 112 kg/ha as pre-plant; and application rates calculated by using the late spring nitrate test (LSNT). The amount of sidedress N applied on LSNT treatments was determined by taking 16, 1-foot deep soil cores from each plot when corn was at the 6th leaf stage. N fertilizer was added, if needed, to increase soil nitrate-N to 25 ppm. The average amount of N applied to LSNT plots ranged from 93-193 kg N/ha, with the no-till system typically requiring more nitrogen than the chisel plow system. The first year of the study (1993) was extremely wet, receiving 35% more rainfall than in a normal year.								

Crop	1	Corn	Yield	7.3 Mg/ha
Crop	3	Corn	Yield	7.3 Mg/ha
Crop	5	Corn	Yield	5.3 Mg/ha
Crop	7	Corn	Yield	9.1 Mg/ha
Crop	9	Corn	Yield	9.9 Mg/ha
Crop	11	Corn	Yield	9.6 Mg/ha

Study ID	**201300554604**	**Study Area**	**NT-S-corn**	Area (ha)	0.40	Tillage	No Till	Cover Crop	None
Practice ID	761	Practice Name	NT-S-corn	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-NT-CS-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Kenyon silty-clay loam soil with 3 to 4 % organic matter								
Fertilizer	The N fertilizer (UAN, liquid urea-ammonium nitrate solution) was applied in the spring of each year. UAN was applied as a single N application at a rate of 112 kg/ha as pre-plant using a spoke injector.								
Comments	This plot study investigated the impacts of late spring soil nitrate tests (LSNT) and no-till (NT) on NPS pollutants and corn yield. Twenty four plots - each 59 x 69m in size (1.0 ac) - were used with two treatments and two controls of 6 replications each. The controls were single N application pre-plant (S) and conventional chisel plow tillage (CP). The N fertilizer was applied using two different N management systems: single N application at a rate of 112 kg/ha as pre-plant; and application rates calculated by using the late spring nitrate test (LSNT). The amount of sidedress N applied on LSNT treatments was determined by taking 16, 1-foot deep soil cores from each plot when corn was at the 6th leaf stage. N fertilizer was added, if needed, to increase soil nitrate-N to 25 ppm. The average amount of N applied to LSNT plots ranged from 93-193 kg N/ha, with the no-till system typically requiring more nitrogen than the chisel plow system. The first year of the study (1993) was extremely wet, receiving 35% more rainfall than in a normal year.								

Crop	1	Corn	Yield	4.3 Mg/ha
Crop	3	Corn	Yield	6.3 Mg/ha
Crop	5	Corn	Yield	5.1 Mg/ha
Crop	7	Corn	Yield	8.4 Mg/ha
Crop	9	Corn	Yield	9.5 Mg/ha
Crop	11	Corn	Yield	8.1 Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013005208	**Kanwar, R. S., 1997**
Location	Nashua, Floyd, IA, US
Study Citation	1997
	Kanwar, R. S., T. S. Colvin and D. L. Karlen.
	Ridge, moldboard, chisel, and no-till effects on tile water quality beneath two cropping systems.
	J. Prod. Agric. 10:227-234.
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Eastern Iowa and Minnesota Till Prairies
HUC_10	0708020112
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	Randomized Complete Block. Field study to quantify the effects of four tillage practice
Crops	Corn, Soybeans
Study Duration	3 years

Summary

Soil conservation tillage systems, including ridge-tillage, often reduce surface water contamination by pesticides because soil erosion and surface runoff are reduced. However, the effects on losses through subsurface drainage tile are somewhat uncertain. Our field study quantified the effects of four tillage practices in continuous corn (Zea Mays L.) and corn-soybean [Glycine max (L.) Merr] rotations on herbicide and nitrate N losses in tile drainage water. Fertilizer and pesticide application methods were uniform for ridge, moldboard, chisel, and no-till systems. Pesticide and nitrate N leaching losses were significantly affected by crop rotation. Tillage practice had little influence on nitrate N and pesticide losses to the subsurface drainage water within a corn-soybean rotation. However, ridge-till and no-till resulted in larger losses of atrazine than the moldboard plow and chisel based systems under continuous corn. Tillage system did not affect the timings of peak tile flow occurrences, although peak tile flow volume was affected by tillage, presumably because each system had its own macropore system related to preservation or annual destruction of biopores by tillage. Corn yields were significantly higher under corn-soybean rotation than with continuous-corn for all tillage practices. These results indicate that continuous corn production is not an environmentally sustainable practice for this area because it resulted in higher nitrate N leaching losses to groundwater, received higher N-applications, and resulted in lower corn yields than the corn-soybean rotation. The results also reinforce the need for studies on chemical placement, rate, and timing for various tillage practices to reduce tile drainage losses of agricultural chemicals.

Study ID	**201300520801**	**Study Area**	**CP-CC**	Area (ha)	14.57	Tillage	Chisel Plow	Cover Crop	None
Practice ID	1	Practice Name	CP-CC	General Practice	Reduced Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.	natural rainfall						
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized complete block design for a total of 36 1-acre plots. Each plot has a tile line passing through the middle of the plot, connected to a sump, and at each of the two borders. Tile lines are monitored continuously for flow. In addition to composite samples, tile water samples from each plot were manually collected for nitrate N analysis 3x per week when tile lines were flowing to observe time base variations in concentration. All tillage systems, including no-till received 1 or 2 passes of cultivation for weed control and aeration.								

Crop	1	Continuous Corn	Yield	133	corn bu/acre

Study ID	**201300520802**	**Study Area**	**CP-CS**	Area (ha)	14.57	Tillage	Chisel Plow	Cover Crop	None
Practice ID	2	Practice Name	CP-CS	General Practice	Reduced Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized complete block design for a total of 36 1-acre plots. Each plot has a tile line passing through the middle of the plot, connected to a sump, and at each of the two borders. Tile lines are monitored continuously for flow. In addition to composite samples, tile water samples from each plot were manually collected for nitrate N analysis 3x per week when tile lines were flowing to observe time base variations in concentration. All tillage systems, including no-till received 1 or 2 passes of cultivation for weed control and aeration.								

Crop	2	corn soybean rotation	Yield	146	corn bu/acre

Study ID	**201300520803**	**Study Area**	**CP-SC**	Area (ha)	14.57	Tillage	Chisel Plow	Cover Crop	None
Practice ID	3	Practice Name	CP-SC	General Practice	Reduced Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized complete block design for a total of 36 1-acre plots. Each plot has a tile line passing through the middle of the plot, connected to a sump, and at each of the two borders. Tile lines are monitored continuously for flow. In addition to composite samples, tile water samples from each plot were manually collected for nitrate N analysis 3x per week when tile lines were flowing to observe time base variations in concentration. All tillage systems, including no-till received 1 or 2 passes of cultivation for weed control and aeration.								

Crop	3	soybean-corn rotation	Yield	-999999	corn bu/acre

Study ID	**201300520804**	**Study Area**	**MP-CC**	Area (ha)	14.57	Tillage	Conventional (Moldboard Plow)	Cover Crop	None
Practice ID	4	Practice Name	MP-CC	General Practice	Conventional Tillage			Area Type	C
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CN-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized complete block design for a total of 36 1-acre plots. Each plot has a tile line passing through the middle of the plot, connected to a sump, and at each of the two borders. Tile lines are monitored continuously for flow. In addition to composite samples, tile water samples from each plot were manually collected for nitrate N analysis 3x per week when tile lines were flowing to observe time base variations in concentration. All tillage systems, including no-till received 1 or 2 passes of cultivation for weed control and aeration.								

Crop	4	Continuous Corn	Yield	133	corn bu/acre

Study ID	**201300520805**	**Study Area**	**MP-CS**	Area (ha)	14.57	Tillage	Conventional (Moldboard Plow)	Cover Crop	None
Practice ID	5	Practice Name	MP-CS	General Practice	Conventional Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CN-CS-EN				
Irrigation	NR	Irrig. Descrip.	natural rainfall						
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								

Crop 5 corn soybean rotation Yield 140 corn bu/acre

Study ID	**201300520806**	**Study Area**	**MP-SC**	Area (ha)	14.57	Tillage	Conventional (Moldboard Plow)	Cover Crop	None
Practice ID	6	Practice Name	MP-SC	General Practice	Conventional Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CN-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								

Crop 6 soybean-corn rotation Yield -999999 corn bu/acre

Study ID	**201300520807**	**Study Area**	**RT-CC**	Area (ha)	14.57	Tillage	Ridge Till	Cover Crop	None
Practice ID	7	Practice Name	RT-CC	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								

Crop	7	Continuous Corn		Yield	123	corn bu/acre			
Study ID	**201300520808**	**Study Area**	**RT-CS**	Area (ha)	14.57	Tillage	Ridge Till	Cover Crop	None
Practice ID	8	Practice Name	RT-CS	General Practice	Conservation Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								
Crop	8	corn soybean rotation		Yield	142	corn bu/acre			
Study ID	**201300520809**	**Study Area**	**RT-SC**	Area (ha)	14.57	Tillage	Ridge Till	Cover Crop	None
Practice ID	9	Practice Name	RT-SC	General Practice	Conservation Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	NR	Irrig. Descrip.	natural rainfall						
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								
Crop	9	soybean-corn rotation		Yield	-999999	corn bu/acre			

Study ID	**201300520810**	**Study Area**	**NT-CC**	Area (ha)	14.57	Tillage	No Till	Cover Crop	None
Practice ID	10	Practice Name	NT-CC	General Practice	No Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-NT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								

Crop 10 Continuous Corn Yield 116 corn bu/acre

Study ID	**201300520811**	**Study Area**	**NT-CS**	Area (ha)	14.57	Tillage	No Till	Cover Crop	None
Practice ID	11	Practice Name	NT-CS	General Practice	No Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-NT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								

Crop 11 corn soybean rotation Yield 143 corn bu/acre

Study ID	**201300520812**	**Study Area**	**NT-SC**	Area (ha)	14.57	Tillage	No Till	Cover Crop	None
Practice ID	12	Practice Name	NT-SC	General Practice	No Tillage, Crop Rotation			Area Type	T
Category	Management	Study Focus	Tillage, Crop Rotation	Practice Overview	NC-CCN-NT-CS-EN				
Irrigation	NR	Irrig. Descrip.							
Soils	Floyd loam (fine-loamy, mixed, mesic Aquic Hapludolls),Kenyon silty-clay loam (fine loamy, mixed, mesic Aquic Hapludolls), and Readlyn loam (fine-loamy, mixed, mesic Aquic Hapludolls). These silty soils are moderately well to poorly drained, lie over loam								
Fertilizer	All crops were cultivated during the season for weed control. Continuous corn plots received 180 lb N/acre each year, while corn-soybean rotation plots received 150 lb N/acre when corn was planted. No N was applied to soybeans. All herbicides were broadcast full width on all tillage plots.								
Comments	This study quantifies the effects of four tillage practices - ridge, moldboard, chisel, and no-till; in two different crop rotations - continuous corn, and corn-soybean rotations. Three replications of each treatment combination were used in a randomized								

Crop	12	soybean-corn rotation	Yield	-999999	corn bu/acre

Test Site ID	Test Site Name
2016001001	Kaspar et al. 2007

Location		Boone	IA	US
Study Citation	2007			
	Kaspar, T.C., Jaynes, D.B., Parkin, T.B., Moorman, T.B.			
	Rye Cover Crop and Gamagrass Strip Effects on NO3 Concentration and Load in Tile Drainage			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0708010503	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	Randomized Complete Block Design with 4 Replications			
Crops	corn, soybean			
Study Duration	4 years			

Summary

The authors compared two cropping system modifications for NO3 concentration and load in subsurface drainage water for a no-till corn (Zea mays L.)-soybean (Glycine max [L.] Merr.) management system. In one treatment, eastern gamagrass (Tripsacum dactyloides L.) was grown in permanent 3.05-m-wide strips above the tiles. For the second treatment, a rye (Secale cereale L.) winter cover crop was seeded over the entire plot area each year near harvest and chemically killed before planting the following spring. Rye winter cover crops grown after corn and soybean have the potential to reduce the NO3 concentrations and loads delivered to surface waters by subsurface drainage systems.

Study ID	**201600100101**	**Study Area**	**Control**	Area (ha)	-99.00	Tillage	No-Till	Cover Crop	None
Practice ID	1	Practice Name	Control	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop, Filter Strip	Practice Overview		NC-CCN-NT-CS-EN			
Irrigation	No	Irrig. Descrip.	Not applicable						
Soils	Canisteo (fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls) and Nicollet (fine-loamy, mixed, superactive, mesic Aquic Hapludolls).								
Fertilizer									
Comments									

Crop	1	Soybean	Yield		
Crop	2	Corn	Yield	12.4	Mg/ha
Crop	3	Soybean	Yield	2.7	Mg/ha
Crop	4	Corn	Yield	13.3	Mg/ha
Crop	5	Soybean	Yield	4.5	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201600100102**	**Study Area**	**Gamagrass**	Area (ha)	-99.00	Tillage	No-Till	Cover Crop	None
Practice ID	2	Practice Name	Gamagrass	General Practice	Cover Crop	Area Type	T
Category	Management	Study Focus	Cover Crop, Filter Strip	Practice Overview	NC-CCN-NT-CS-EO		
Irrigation	No	Irrig. Descrip.	Not applicable				
Soils	Canisteo (fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls) and Nicollet (fine-loamy, mixed, superactive, mesic Aquic Hapludolls).						
Fertilizer							
Comments							

Crop	6	Soybean	Yield		
Crop	7	Corn	Yield	12.1	Mg/ha
Crop	8	Soybean	Yield	2.4	Mg/ha
Crop	9	Corn	Yield	13.1	Mg/ha
Crop	10	Soybean	Yield	4.2	Mg/ha

Study ID	**201600100103**	**Study Area**	**Cover Crop**	Area (ha)	-99.00	Tillage	No-Till	Cover Crop	Rye
Practice ID	3	Practice Name	Cover Crop	General Practice	Cover Crop	Area Type	T
Category	Management	Study Focus	Cover Crop, Filter Strip	Practice Overview	NC-CCY-NT-CS-EN		
Irrigation	No	Irrig. Descrip.	Not applicable				
Soils	Canisteo (fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls) and Nicollet (fine-loamy, mixed, superactive, mesic Aquic Hapludolls).						
Fertilizer							
Comments							

Crop	11	Soybean	Yield		
Crop	12	Corn	Yield	11.2	Mg/ha
Crop	13	Soybean	Yield	2.7	Mg/ha
Crop	14	Corn	Yield	13.3	Mg/ha
Crop	15	Soybean	Yield	4.2	Mg/ha

Test Site ID	Test Site Name
2016002006	**Kaspar et al., 2012**

Location		Boone	IA	US
Study Citation	2012			
	Kaspar, T. C., Jaynes, D. B., Parkin, T. B., Moorman, J. B., Singer, J. W.			
	Effectiveness of oat and rye cover crops in reducing nitrate losses in drainage water			
	Agricultural Waste Management			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0708010503	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	Three cover crop treatments (control, rye, and oat) were monitored for subsurface nitrate and drainage volumes. Each treatment was replicated four times for a total of 12 plots.			
Crops	Corn and Soybean			
Study Duration	5 years			

Summary

The effectiveness of oat (Avena sativa L.) and rye (Secale cereale L.) cover crops in reducing NO3 concentrations and loads in subsurface drainage water were evaluated. The rye winter cover crop significantly reduced drainage water NO3 concentrations by 48% over five years, but this was less than the 58% reduction observed in its first four years of use, during a previous study. The oat fall cover crop reduced NO3 concentrations by 26% or about half of the reduction of the rye cover crop. Neither cover crop significantly reduced cumulative drainage or nitrate loads because of variability in cumulative annual drainage among plots.

Study ID	**201600200601**	**Study Area**	**No Cover - Control**	Area (ha)	0.53	Tillage	No-Till	Cover Crop	
Practice ID	1	Practice Name	No Cover - Control	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop	Practice Overview		NM-CCN-NT-CS-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo (fine loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls) and Nicollet (fine-loamy, mixed, superactive, mesic Aquic Hapludolls)								
Fertilizer									
Comments									

Crop	1	Soybean	Yield	1.8	Mg/acre
Crop	2	Corn	Yield	5.4	Mg/acre
Crop	3	Soybean	Yield	0.9	Mg/acre
Crop	4	Corn	Yield	5.4	Mg/acre

Crop	5	Soybean	Yield	1	Mg/acre		
Crop	6	Corn	Yield	4.5	Mg/acre		
Study ID	**201600200602**	**Study Area**	**Oat Cover Crop**	Area (ha)	0.53	Tillage	No-Till
Cover Crop	Oat						
Practice ID	2	Practice Name	Oat Cover Crop	General Practice	Cover Crop	Area Type	T
Category	Management	Study Focus	Cover Crop	Practice Overview	NM-CCY-NT-CS-EN		
Irrigation	No	Irrig. Descrip.					
Soils	Canisteo (fine loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls) and Nicollet (fine-loamy, mixed, superactive, mesic Aquic Hapludolls)						
Fertilizer							
Comments							
Crop	7	Soybean	Yield	1.5	Mg/acre		
Crop	8	Corn	Yield	5.1	Mg/acre		
Crop	9	Soybean	Yield	0.8	Mg/acre		
Crop	10	Corn	Yield	5.2	Mg/acre		
Crop	11	Soybean	Yield	0.8	Mg/acre		
Crop	12	Corn	Yield	4.2	Mg/acre		
Study ID	**201600200603**	**Study Area**	**Rye Cover Crop**	Area (ha)	0.53	Tillage	No-Till
Cover Crop	Ryegrass						
Practice ID	3	Practice Name	Rye Cover Crop	General Practice	Cover Crop	Area Type	T
Category	Management	Study Focus	Cover Crop	Practice Overview	NM-CCY-NT-CS-EN		
Irrigation	No	Irrig. Descrip.					
Soils	Canisteo (fine loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls) and Nicollet (fine-loamy, mixed, superactive, mesic Aquic Hapludolls)						
Fertilizer							
Comments							
Crop	13	Soybean	Yield	1.7	Mg/acre		
Crop	14	Corn	Yield	5.3	Mg/acre		
Crop	15	Soybean	Yield	0.8	Mg/acre		
Crop	16	Corn	Yield	5.5	Mg/acre		
Crop	17	Soybean	Yield	1	Mg/acre		

Crop	18	Corn	Yield	4.5	Mg/acre

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2014002001	**Kimmel 2001**

Location	Ottawa	Franklin	KS	US
Study Citation	2001			
	R. J. Kimmell, G. M. Pierzynski, K. A. Janssen, P.L. Barnes			
	Effects of Tillage and Phosphorous Placement on Phosphorous Runoff Losses in a Grain Sorghum-Soybean Rotation			
	J. Environmental Quality 30:1324-1330 (2001)			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Cherokee Prairies			
HUC_10	1029010104	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	plot study: complete randomized block			
Crops	Sorghum, Soybeans			
Study Duration	2 years			

Summary

Phosphorous enhances eutrophication of fresh water bodies. This study was conducted to determine the influence of tillage and P placement on P losses in runoff water from a somewhat poorly drained soil (Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope) in a grain sorghum [Sorghum bicolor (L.) Moench]-soybean [Glycine max (L.) Merr] rotation. Chisel-disk-field cultivate (ChT), ridge-till (RT), and no-till (NT) in combination with 0 kg P ha-1 or 24 kg P ha-1 broadcast or knifed (applied prior to planting grain sorghum) were studied. runoff volume and losses of sediment and P were summed over the growing season. Significant interactions between tillage and P placement for soluble P losses were found. For example, soluble P loss in 1999 for NT-broadcast in grain sorghum 358 g/ha; significantly greater than 31 g ha21 for NT-knife or 23 g ha21 for NT-check. Similar results were found for RT but no such differences were found for ChT. Bioavailable P losses were generally highest with broadcast P placement and for NT and RT. Total P losses were significantly higher at 959 g ha21 with broadcast P on grain sorghum in 1998, compared with 521 g ha21 for the check and 659 g ha21 for the knifed P applications. Total P losses in 1999 for soybeans were only 18 g ha21 for NT, which was significantly lower than 75 g ha21 for ChT and 66 g ha21 for RT. The results indicate that broadcast P applications on RT and NT will increase P losses, but the influence of tillage was not consistent.

Study ID	**201400200101**	**Study Area**	**ChT-Broadcast SB**	Area (ha)	0.01	Tillage	Chisel Plow	Cover Crop	None
Practice ID	1	Practice Name	ChT-Broadcast SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	1	Soybean, for grain	Yield	-999999	NA
Crop	19	Soybean, for grain	Yield	-999999	NA

Study ID	**201400200102**	**Study Area**	**ChT-Broadcast SG**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	None
Practice ID	2	Practice Name	ChT-Broadcast SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	In spring: 24 kg P/ha surface-broadcast. Phosphorus was applied as a liquid product containing 70 g N/kg, 95 g P /kg, and 58 g K /kg. Nitrogen was balanced at 112 kg/ha across all treatments using liquid ammonium nitrate solution containing 280 g N/ha.								
Comments									

Crop	2	Sorghum, for grain	Yield	-999999 NA
Crop	20	Sorghum, for grain	Yield	-999999 NA

Study ID	**201400200103**	**Study Area**	**ChT-Check SB**	Area (ha)	0.01	Tillage	Chisel Plow	Cover Crop	None
Practice ID	3	Practice Name	ChT-Check SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	3	Soybean, for grain	Yield	-999999 NA
Crop	21	Soybean, for grain	Yield	-999999 NA

Study ID	**201400200104**	**Study Area**	**ChT-Check SG**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	None
Practice ID	4	Practice Name	ChT-Check SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	no P applied								
Comments									

Crop	4	Sorghum, for grain	Yield	-999999 NA
Crop	22	Sorghum, for grain	Yield	-999999 NA

Study ID	**201400200105**	**Study Area**	**ChT-Knifed SB**	Area (ha)	0.01	Tillage	Chisel Plow	Cover Crop	None
Practice ID	5	Practice Name	ChT-Knifed SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	5	Soybean, for grain	Yield	-999999 NA
Crop	23	Soybean, for grain	Yield	-999999 NA

Study ID	**201400200106**	**Study Area**	**ChT-Knifed SG**	Area (ha)	0.00	Tillage	Chisel Plow	Cover Crop	None
Practice ID	6	Practice Name	ChT-Knifed SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	In spring: 24 kg P/ha knifed into the soil approximately 10 cm deep on 38-cm centers.Phosphorus was applied as a liquid product containing 70 g N/kg, 95 g P /kg, and 58 g K /kg. Nitrogen was balanced at 112 kg/ha across all treatments using liquid ammonium nitrate solution containing 280 g N/ha.								
Comments									

Crop	6	Sorghum, for grain	Yield	-999999 NA
Crop	24	Sorghum, for grain	Yield	-999999 NA

Study ID	**201400200107**	**Study Area**	**NT-Broadcast SB**	Area (ha)	0.01	Tillage	No Till	Cover Crop	None
Practice ID	7	Practice Name	NT-Broadcast SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-NT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	7	Soybean, for grain	Yield	-999999 NA
Crop	25	Soybean, for grain	Yield	-999999 NA

Study ID	**201400200108**	**Study Area**	**NT-Broadcast SG**	Area (ha)	0.00	Tillage	No Till	Cover Crop	None
Practice ID	8	Practice Name	NT-Broadcast SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-NT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	In spring: 24 kg P/ha surface-broadcast.Phosphorus was applied as a liquid product containing 70 g N/kg, 95 g P /kg, and 58 g K /kg. Nitrogen was balanced at 112 kg/ha across all treatments using liquid ammonium nitrate solution containing 280 g N/ha.								
Comments									

Crop	8	Sorghum, for grain	Yield	-999999	NA
Crop	26	Sorghum, for grain	Yield	-999999	NA

Study ID	**201400200109**	**Study Area**	**NT-Check SB**	Area (ha)	0.01	Tillage	No Till	Cover Crop	None
Practice ID	9	Practice Name	NT-Check SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-NT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	9	Soybean, for grain	Yield	-999999	NA
Crop	27	Soybean, for grain	Yield	-999999	NA

Study ID	**201400200110**	**Study Area**	**NT-Check SG**	Area (ha)	0.00	Tillage	No Till	Cover Crop	None
Practice ID	10	Practice Name	NT-Check SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-NT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	no P applied								
Comments									

Crop	10	Sorghum, for grain	Yield	-999999	NA
Crop	28	Sorghum, for grain	Yield	-999999	NA

Study ID	**201400200111**	**Study Area**	**NT-Knifed SB**	Area (ha)	0.01	Tillage	No Till	Cover Crop	None
Practice ID	11	Practice Name	NT-Knifed SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-NT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	11	Soybean, for grain	Yield	-999999	NA
Crop	29	Soybean, for grain	Yield	-999999	NA

Study ID	**201400200112**	**Study Area**	**NT-Knifed SG**	Area (ha)	0.00	Tillage	No Till	Cover Crop	None
Practice ID	12	Practice Name	NT-Knifed SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-NT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	In spring: 24 kg P/ha knifed into the soil approximately 10 cm deep on 38-cm centers.Phosphorus was applied as a liquid product containing 70 g N/kg, 95 g P /kg, and 58 g K /kg. Nitrogen was balanced at 112 kg/ha across all treatments using liquid ammonium nitrate solution containing 280 g N/ha.								
Comments									

Crop	12	Sorghum, for grain	Yield	-999999	NA
Crop	30	Sorghum, for grain	Yield	-999999	NA

Study ID	**201400200113**	**Study Area**	**RT-Broadcast SB**	Area (ha)	0.01	Tillage	Ridge Till	Cover Crop	None
Practice ID	13	Practice Name	RT-Broadcast SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	13	Soybean, for grain	Yield	-999999	NA
Crop	31	Soybean, for grain	Yield	-999999	NA

Study ID	**201400200114**	**Study Area**	**RT-Broadcast SG**	Area (ha)	0.00	Tillage	Ridge Till	Cover Crop	None
Practice ID	14	Practice Name	RT-Broadcast SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	In spring: 24 kg P/ha surface-broadcast. Phosphorus was applied as a liquid product containing 70 g N/kg, 95 g P /kg, and 58 g K /kg. Nitrogen was balanced at 112 kg/ha across all treatments using liquid ammonium nitrate solution containing 280 g N/ha.								
Comments									

Crop	14	Sorghum, for grain	Yield	-999999	NA
Crop	32	Sorghum, for grain	Yield	-999999	NA

Study ID	**201400200115**	**Study Area**	**RT-Check SB**	Area (ha)	0.01	Tillage	Ridge Till	Cover Crop	None
Practice ID	15	Practice Name	RT-Check SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	15	Soybean, for grain	Yield	-999999	NA
Crop	33	Soybean, for grain	Yield	-999999	NA

Study ID	**201400200116**	**Study Area**	**RT-Check SG**	Area (ha)	0.00	Tillage	Ridge Till	Cover Crop	None
Practice ID	16	Practice Name	RT-Check SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	no P applied								
Comments									

Crop	16	Sorghum, for grain	Yield	-999999	NA
Crop	34	Sorghum, for grain	Yield	-999999	NA

Study ID	**201400200117**	**Study Area**	**RT-Knifed SB**	Area (ha)	0.01	Tillage	Ridge Till	Cover Crop	None
Practice ID	17	Practice Name	RT-Knifed SB	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NF-CCN-CT-SB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	Not applied on soybean plots.								
Comments									

Crop	17	Soybean, for grain	Yield	-999999	NA
Crop	35	Soybean, for grain	Yield	-999999	NA

Study ID	**201400200118**	**Study Area**	**RT-Knifed SG**	Area (ha)	0.00	Tillage	Ridge Till	Cover Crop	None
Practice ID	18	Practice Name	RT-Knifed SG	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-SG-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Woodson silt loam [fine, smectitic, thermic Abruptic Argiaquoll], 1.0-1.5% slope								
Fertilizer	In spring: 24 kg P/ha knifed into the soil approximately 10 cm deep on 38-cm centers. Phosphorus was applied as a liquid product containing 70 g N/kg, 95 g P /kg, and 58 g K /kg. Nitrogen was balanced at 112 kg/ha across all treatments using liquid ammonium nitrate solution containing 280 g N/ha.								
Comments									

Crop	18	Sorghum, for grain	Yield	-999999	NA
Crop	36	Sorghum, for grain	Yield	-999999	NA

Test Site ID	Test Site Name
2016002011	**Kladivko et al., 2004**

Location		Jennings	IN	US
Study Citation	2004			
	Kladivko, E. J., Frankenberger, J. R., Jaynes, D. B., Meek, D. W., Jenkinson, B. J., Fausey, N. R.			
	Nitrate Leaching to Subsurface Drains as Affected by Drain Spacing and Changes in Crop Production System			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Southern Illinois and Indiana Thin Loess and Till Plain, Western Part			
HUC_10	0512020703	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	Non-randomized blocks with replication			
Crops	Corn, Corn-Soybean-Winter Wheat			
Study Duration	15 years			

Summary

Subsurface drainage is a beneficial water management practice in poorly drained soils but may also contribute substantial nitrate N loads to surface waters. This paper summarizes results from a 15-yr drainage study in Indiana that includes three drain spacings (5, 10, and 20 m) managed for 10 yr with chisel tillage in monoculture corn (Zea mays L.) and currently managed under a no-till corn–soybean [Glycine max (L.) Merr.] rotation. In general, drainflow and nitrate N losses per unit area were greater for narrower drain spacings. Nitrate N concentrations in drainflow did not vary with spacing, but concentrations have significantly decreased from the beginning to the end of the experiment. Flow-weighted mean concentrations decreased from 28 mg/L in the 1986–1988 period to 8 mg/L in the 1997–1999 period. The reduction in concentration was due to both a reduction in fertilizer N rates over the study period and to the addition of a winter cover crop as a “trap crop” after corn in the corn–soybean rotation. Annual nitrate N loads decreased from 38 kg/ha in the 1986–1988 period to 15 kg/ha in the 1997–1999 period. Most of the nitrate N losses occurred during the fallow season, when most of the drainage occurred.

Study ID	**201600201101**	**Study Area**	**5 m Tile Spacing (Conventional, High Fert.)**	Area (ha)	0.45	Tillage	Conventional (Chisel)	Cover Crop	None
Practice ID	1	Practice Name	5 m Tile Spacing (Conventional, High Fert.)	General Practice	Control			Area Type	C
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1985 to 1988: Conventional tillage, high fertilizer input, 5 m tile drain spacing.								

Crop	1	Corn	Yield	4.5	Mg/acre
Crop	4	Corn	Yield	3.3	Mg/acre
Crop	7	Corn	Yield	4.7	Mg/acre

Crop	10	Corn		Yield	3.2	Mg/acre			
Study ID	**201600201102**	**Study Area**	**10 m Tile Spacing (Conventional, High Fert.)**	Area (ha)	0.90	Tillage	Conventional (Chisel)	Cover Crop	None
Practice ID	2	Practice Name	10 m Tile Spacing (Conventional, High Fert.)	General Practice	Control			Area Type	C
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1985 to 1988: Conventional tillage, high fertilizer input, 10 m tile drain spacing.								
Crop	2	Corn		Yield	4.7	Mg/acre			
Crop	5	Corn		Yield	3.4	Mg/acre			
Crop	8	Corn		Yield	4.9	Mg/acre			
Crop	11	Corn		Yield	3.4	Mg/acre			
Study ID	**201600201103**	**Study Area**	**20 m Tile Spacing (Conventional, High Fert.)**	Area (ha)	1.80	Tillage	Conventional (Chisel)	Cover Crop	None
Practice ID	3	Practice Name	20 m Tile Spacing (Conventional, High Fert.)	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1985 to 1988: Conventional tillage, high fertilizer input, 15 m tile drain spacing.								
Crop	3	Corn		Yield	4.6	Mg/acre			
Crop	6	Corn		Yield	3.4	Mg/acre			
Crop	9	Corn		Yield	4.9	Mg/acre			
Crop	12	Corn		Yield	3.1	Mg/acre			

Study ID	**201600201104**	**Study Area**	**5 m Tile Spacing (Conventional, Low Fert.)**	Area (ha)	0.45	Tillage	Conventional (Chisel)	Cover Crop	None
Practice ID	4	Practice Name	5 m Tile Spacing (Conventional, Low Fert.)	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1989 to 1993: Conventional tillage, reduced fertilizer input, 5 m tile drain spacing.								

Crop	13	Corn	Yield	4	Mg/acre
Crop	16	Corn	Yield	3.4	Mg/acre
Crop	19	Corn	Yield	3	Mg/acre
Crop	22	Corn	Yield	4.3	Mg/acre
Crop	25	Corn	Yield	4.1	Mg/acre

Study ID	**201600201105**	**Study Area**	**10 m Tile Spacing (Conventional, Low Fert.)**	Area (ha)	0.90	Tillage	Conventional (Chisel)	Cover Crop	None
Practice ID	5	Practice Name	10 m Tile Spacing (Conventional, Low Fert.)	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1989 to 1993: Conventional tillage, reduced fertilizer input, 10 m tile drain spacing.								

Crop	14	Corn	Yield	3.9	Mg/acre
Crop	17	Corn	Yield	3.1	Mg/acre
Crop	20	Corn	Yield	2.9	Mg/acre
Crop	23	Corn	Yield	4.3	Mg/acre
Crop	26	Corn	Yield	4	Mg/acre

Study ID	**201600201106**	**Study Area**	**20 m Tile Spacing (Conventional, Low Fert.)**	Area (ha)	1.80	Tillage	Conventional (Chisel)	Cover Crop	None
Practice ID	6	Practice Name	20 m Tile Spacing (Conventional, Low Fert.)	General Practice	Drainage Water Management, Nutrient Management			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1989 to 1993: Conventional tillage, reduced fertilizer input, 20 m tile drain spacing.								

Crop	15	Corn	Yield	3.6	Mg/acre
Crop	18	Corn	Yield	3.1	Mg/acre
Crop	21	Corn	Yield	3.2	Mg/acre
Crop	24	Corn	Yield	4.1	Mg/acre
Crop	27	Corn	Yield	4	Mg/acre

Study ID	**201600201107**	**Study Area**	**5 m Tile Spacing (Rotation and Tillage Management)**	Area (ha)	0.45	Tillage	No-Till	Cover Crop	Winter Wheat
Practice ID	7	Practice Name	5 m Tile Spacing (Rotation and Tillage Management)	General Practice	Crop Rotation, Conservation Tillage, Cover Crop			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NM-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1994 to 1999: No-till, corn-soybean rotation, reduced fertilizer input, 5 m tile drain spacing.								

Crop	28	Soybean	Yield	1.9	Mg/acre
Crop	31	Corn	Yield	3.5	Mg/acre
Crop	34	Soybean	Yield	1.4	Mg/acre
Crop	37	Corn	Yield	3.6	Mg/acre
Crop	40	Soybean	Yield	1.4	Mg/acre

Crop	43	Corn		Yield	4	Mg/acre			
Study ID	**201600201108**	**Study Area**	**10 m Tile Spacing (Rotation and Tillage Management)**	Area (ha)	0.90	Tillage	No-Till	Cover Crop	Winter Wheat
Practice ID	8	Practice Name	10 m Tile Spacing (Rotation and Tillage Management)	General Practice	Crop Rotation, Conservation Tillage, Cover Crop			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NM-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1994 to 1999: No-till, corn-soybean rotation, reduced fertilizer input, 10 m tile drain spacing.								
Crop	29	Soybean		Yield	1.8	Mg/acre			
Crop	32	Corn		Yield	3.4	Mg/acre			
Crop	35	Soybean		Yield	1.4	Mg/acre			
Crop	38	Corn		Yield	3.5	Mg/acre			
Crop	41	Soybean		Yield	1.4	Mg/acre			
Crop	44	Corn		Yield	4.1	Mg/acre			
Study ID	**201600201109**	**Study Area**	**20 m Tile Spacing (Rotation and Tillage Management)**	Area (ha)	1.80	Tillage	No-Till	Cover Crop	Winter Wheat
Practice ID	9	Practice Name	20 m Tile Spacing (Rotation and Tillage Management)	General Practice	Crop Rotation, Conservation Tillage, Cover Crop			Area Type	T
Category	Management	Study Focus	Drainage, Cropping System	Practice Overview	NM-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Clermont silt loam (fine silty, each spacing acting as common drains between treatments mixed, superactive, mesic Typic Glossaqualf). The surface soil at the study site is light gray, low organic carbon (0.7%), silt loam containing 66% silt, 22% sand,and								
Fertilizer									
Comments	1994 to 1999: No-till, corn-soybean rotation, reduced fertilizer input, 20 m tile drain spacing.								
Crop	30	Soybean		Yield	1.9	Mg/acre			
Crop	33	Corn		Yield	3.7	Mg/acre			
Crop	36	Soybean		Yield	1.5	Mg/acre			

Crop	39	Corn	Yield	3.6	Mg/acre
Crop	42	Soybean	Yield	1.4	Mg/acre
Crop	45	Corn	Yield	4.1	Mg/acre

Test Site ID	Test Site Name
2013005224	**LaLonde, V., 1996**

Location	Bainesville	Ontario	XX	CA
Study Citation	1996			
	LaLonde, V., C. A. Madramootoo, L. Trenholm and R. S. Broughton.			
	Effects of controlled drainage on nitrate concentrations in subsurface drain discharge.			
	Agric. Water Manage. 29:187-199.			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	Randomized Complete Block with Replication. A water table management field study.			
Crops	Corn, Soybeans			
Study Duration	2 years			

Summary

A water table management field study was conducted on a Bainsville silt loam soil during 1992 and 1993. The water table levels studied were conventional free outlet subsurface drainage (FD), and controlled water tables (CWT) of 0.50 and 0.25 m above the drain level. The three treatments were replicated thrice resulting in nine plots, each measuring 115 m long by 18.69 m wide. A subsurface drain was installed 1.0 m deep in the center of each plot. Drain discharge, nitrate concentrations in drainage effluent, rainfall and water table elevations were measured during the two growing seasons. The plots were cropped with grain corn (Zea mays L.) in 1992 and soybean (Glycine max (L.) Mill.) in 1993. Controlled drainage had a significant effect on drain discharge quantity and quality. In 1992, the 0.25 and 0.50 c CWT treatments reduced drain flow by 58.7% and 65.3% respectively; and in 1993, by 40.9% and 95%, respectively, compared with the FD treatment. In 1992, there was a 75.9% and 68.9% reduction of nitrate concentration in drain flow with the 0.25 and 0.50 m CWT, respectively. While it was impossible to maintain the water tables consistently at 0.5 and 0.25 m throughout the growing season, these results show that there are significant environmental benefits with controlled drainage.

Study ID	**201300522401**	**Study Area**	**CWT-0.25**	Area (ha)	0.64	Tillage	Ridge Till	Cover Crop	None
Practice ID	386	Practice Name	CWT-0.25	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NF-CCN-CT-CS-ED				
Irrigation	Yes	Irrig. Descrip.	No irrigation in 1993.						

Soils	The upper 1 m soil profile was comprised of three distinct layers: The upper zone (O-0.30 m) was a sandy loam, the 0.30-0.60 m zone was a loam, and there was a clay loam at 0.6-1.0 m overlying a marine clay. Measurements of the in-situ saturated hydraulic
Fertilizer	No fertilizer was applied, as soybean is a nitrogen fixing crop.
Comments	Three treatments with three replications were used in this study, each plot being 115 x 18.69m in size. A subsurface drain was installed 1.0 m deep along the center of each plot at a 0.1% slope. Plots were all cropped with corn in 1992 and with soybeans in 1993. The water table did not remain at the desired level due to evapotranspiration and deep seepage. Water samples were taken daily for one week in each of three months during the growing season each year. 1993 was considerably drier than 1992.

Crop	1	grain corn (Zea mays L.)	Yield	-999999
Crop	2	soybean (Glycine mux (L.) Merr.)	Yield	-999999

Study ID	**201300522402**	**Study Area**	**CWT-0.50**	Area (ha)	0.64	Tillage	Ridge Till	Cover Crop	None
Practice ID	387	Practice Name	CWT-0.50	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CS-ED				
Irrigation	Yes	Irrig. Descrip.	Due to early dry summer/low water table, sprinkler irrigation in early July to raise water table. Irrigation occurred in three blocks. On 13 and 14 July, 72.3 mm applied to Block 1. Blocks 2 and 3 each received 75.5 mm on 15 and 16 July. 3X/day during irrigation, water samples were collected from flowing drains, and water table elevations were measured. Rain on 12/ 13 July 1992 raised both the 0.25 m CWT and FD over the 0.25 m WTD above the drain lines. On 13 July, the 31.5 mm applied on Block 1 raised the water table an average of 0.05 m, so all drain laterals on the FD and 0.25 m CWT plots flowed. The next day, 40.8 mm applied and raised water table an average of 0.20 m, as the soil moisture level was closer to field capacity after the first irrigation application.							
Soils	The upper 1 m soil profile was comprised of three distinct layers: The upper zone (O-0.30 m) was a sandy loam, the 0.30-0.60 m zone was a loam, and there was a clay loam at 0.6-1.0 m overlying a marine clay. Measurements of the in-situ saturated hydraulic								
Fertilizer	Corn was planted on 13 May 1992 and side-dressed with 73 kg N/ha of liquid 6-24-6 fertilizer (anhydrous ammonia). Six weeks later, on 1 July, the ridges were reformed around the young corn stalks and another 168 kg/ha of liquid N fertilizer were applied.								
Comments	Three treatments with three replications were used in this study, each plot being 115 x 18.69m in size. A subsurface drain was installed 1.0 m deep along the center of each plot at a 0.1% slope. Plots were all cropped with corn in 1992 and with soybeans in 1993. The water table did not remain at the desired level due to evapotranspiration and deep seepage. Water samples were taken daily for one week in each of three months during the growing season each year. 1993 was considerably drier than 1992.								

Crop	1	grain corn (Zea mays L.)	Yield	-999999
Crop	2	soybean (Glycine mux (L.) Merr.)	Yield	-999999

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300522403**	**Study Area**	**FD**	Area (ha)	0.64	Tillage	Ridge Till	Cover Crop	None
Practice ID	385	Practice Name	FD	General Practice	Control			Area Type	C
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CS-EN				
Irrigation	Yes	Irrig. Descrip.	Due to early dry summer/low water table, sprinkler irrigation in early July to raise water table. Irrigation occurred in three blocks. On 13 and 14 July, 72.3 mm applied to Block 1. Blocks 2 and 3 each received 75.5 mm on 15 and 16 July. 3X/day during irrigation, water samples were collected from flowing drains, and water table elevations were measured. Rain on 12/ 13 July 1992 raised both the 0.25 m CWT and FD over the 0.25 m WTD above the drain lines. On 13 July, the 31.5 mm applied on Block 1 raised the water table an average of 0.05 m, so all drain laterals on the FD and 0.25 m CWT plots flowed. The next day, 40.8 mm applied and raised water table an average of 0.20 m, as the soil moisture level was closer to field capacity after the first irrigation application.						
Soils	The upper 1 m soil profile was comprised of three distinct layers: The upper zone (O-0.30 m) was a sandy loam, the 0.30-0.60 m zone was a loam, and there was a clay loam at 0.6-1.0 m overlying a marine clay. Measurements of the in-situ saturated hydraulic								
Fertilizer	Corn was planted on 13 May 1992 and side-dressed with 73 kg N/ha of liquid 6-24-6 fertilizer (anhydrous ammonia). Six weeks later, on 1 July, the ridges were reformed around the young corn stalks and another 168 kg/ha of liquid N fertilizer were applied.								
Comments	Three treatments with three replications were used in this study, each plot being 115 x 18.69m in size. A subsurface drain was installed 1.0 m deep along the center of each plot at a 0.1% slope. Plots were all cropped with corn in 1992 and with soybeans in 1993. The water table did not remain at the desired level due to evapotranspiration and deep seepage. Water samples were taken daily for one week in each of three months during the growing season each year. 1993 was considerably drier than 1992.								

Crop	1	grain corn (Zea mays L.)	Yield	-999999
Crop	2	soybean (Glycine mux (L.) Merr.)	Yield	-999999

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013005228	**Langland, M. J., 1995**
Location	Fawn Grove, York, PA, US
Study Citation	1995
	Langland, M. J. and D. K. Fishel.
	Hydrology and the effects of selected agricultural best management practices in the Bald Eagle Creek watershed, York County, Pennsylvania, prior to and during nutrient management.
	U. S. Geological Survey. Water-Resources Investigations Report 93-4069. Lemoyne, Pennsylvania.
NRCS LRR	Northern Atlantic Slope Diversified Farming Region
NRCS MLRA	Northern Appalachian Ridges and Valleys
HUC_10	0205030613 — Test Site Scale: Subwatershed
Experimental Design Type/ Description	Before-After
	pre- and post-BMP
Crops	Corn, alfalfa, barley, oats/alfalfa, potatoes, rye, soybeans, wheat
Study Duration	5 years

Summary

The U.S. Geological Survey, in cooperation with the Susquehanna River Basin Commission and the Pennsylvania Department of Environmental Resources, conducted a study as part of the U.S. Environmental Protection Agency's Chesapeake Bay Program to determine the effects of nutrient management on surface-water quality by reducing animal units in a 0.43 square-mile agricultural watershed in York County. The study was conducted primarily from October 1985 through September 1990 prior to and during the implementation of nutrient-management practices designed to reduce nutrient and sediment discharges. Intermittent sampling continued until August 1991. The Bald Eagle Creek Basin is underlain by schist and quartzite. About 87 percent of the watershed is cropland and pasture. Nearly 33 percent of the cropland was planted in corn prior to nutrient management, whereas 22 percent of the cropland was planted in corn during the nutrient-management phase. The animal population was reduced by 49 percent during nutrient management. Average annual applications of nitrogen and phosphorus from manure to cropland were reduced by 3,940 pounds (39 percent) and 910 pounds (46 percent), respectively, during nutrient management. A total of 94,560 pounds of nitrogen (538 pounds per acre) and 26,400 pounds of phosphorus (150 pounds per acre) were applied to the cropland as commercial fertilizer and manure during the 5-year study. Core samples from the top 4 feet of soil were collected prior to and during nutrient management and analyzed for concentrations of nitrogen and phosphorus. The average amount of nitrate nitrogen in the soil ranged from 36 to 135 pounds per acre, and soluble phosphorus ranged from 0.39 to 2.5 pounds per acre, prior to nutrient management. During nutrient management, nitrate nitrogen in the soil ranged from 21 to 291 pounds per acre and soluble phosphorus ranged from 0.73 to 1.7 pounds per acre. Precipitation was about 18 percent below normal and streamflow was 35 percent below normal prior to nutrient management, whereas precipitation was 4 percent above normal and streamflow was 3 percent below normal during the first two years of nutrient management. Eighty-four percent of the 20.44 inches of streamflow was base flow prior to nutrient management and 54 percent of the 31.14 inches of streamflow was base flow during the first 2 years of the nutrient-management phase. About 31 percent of the measured precipitation during the first 4 years of the study was discharged as surface water; the remaining 69 percent was removed as

evapotranspiration or remained in groundwater storage. Median concentrations of total nitrogen and dissolved nitrate plus nitrate in base flow increased from 4.9 and 4.1 milligrams per liter as nitrogen, respectively, prior to nutrient management to 5.8 and 5.0 milligrams per liter, respectively, during nutrient management. Median concentrations of ammonia nitrogen and organic nitrogen did not change significantly in base flow. Median concentrations of total and dissolved phosphorus in base flow did not change significantly and were 0.05 and 0.03 milligrams per liter as phosphorus, respectively, prior to the management phase, and 0.05 and 0.04 milligrams per liter, respectively, during the management phase. Concentrations and loads of dissolved nitrate plus nitrate in base flow increased following wet periods after crops were harvested and manure was applied. During the growing season, concentrations and loads decreased as nutrient utilization and evapotranspiration by corn increased. About 4,550 pounds of sustained sediment, 5,300 pounds of nitrogen, and 70.4 pounds of phosphorus discharged in base flow in the 2 years prior to nutrient management. During the first 2 years of nutrient management about 2,860 pounds of sustained sediment, 5,700 pounds of nitrogen, and 46.6 pounds of phosphorus discharged in base flow. Prior to nutrient management, about 260,000 pounds of sustained sediment, about 2,180 pounds of nitrogen, and about 235 pounds of phosphorus discharged in stormflow. During the first two years of nutrient management about 464,000 pounds of suspended sediment, 6,120 pounds of nitrogen, and 912 pounds of phosphorus discharged in stormflow. The seasonal rank-sum test indicated that significant differences were detected in the medians of total nitrogen and dissolved nitrate plus nitrate in base flow prior to and during nutrient management. The seasonal Kendall test indicated significant upwards trends in concentrations and loads of total nitrogen and dissolved-nitrate plus nitrate measured in base flow during the entire study. Neither significant decreases nor trends were detected in the concentrations and loads for ammonia, ammonia plus organic nitrogen, phosphorus, or suspended sediment in base flow.

Study ID	**201300522801**	**Study Area**	**Fawn Grove**	Area (ha)	111.29	Tillage	Not specified	Cover Crop	
Practice ID	465	Practice Name	WY8687	General Practice		Control		Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Glenelg channery and Elioak silt loam								
Fertilizer	Farmers reported that approximately 61,740 lb of nitrogen and 16,610 lb of phosphorus where applied as manure and commercial fertilizer to cropland during the 2 years prior to the management phase								
Comments	This study compares pre-BMP data (water years 1986 and 1987) with post-BMP data (water years 1988 and 1989) on a 275 acre agricultural watershed, where reductions were made in the number of animal units and applied nutrients. This watershed is underlain by non-carbonate rock. Average annual applied N and P were reduced from 30,870 and 8,305 lbs/yr in the pre-BMP period, to 10,940 and 3,263 lbs/yr, respectively, in the post-BMP period. The percent of streamflow due to baseflow changed from 83-85% in the pre-BMP years to 43-68% in the post-BMP years, due to increased rainfall in the post-BMP period.								

Crop	1	Alfalfa	Yield	-999999	NA
Crop	2	Barley	Yield	-999999	NA
Crop	3	Corn	Yield	-999999	NA
Crop	4	Oats/alfalfa	Yield	-999999	NA
Crop	5	Soybeans	Yield	-999999	NA
Crop	6	Wheat	Yield	-999999	NA
Crop	7	Alfalfa	Yield	-999999	NA
Crop	8	Corn	Yield	-999999	NA
Crop	9	Oats/alfalfa	Yield	-999999	NA
Crop	10	Potatoes	Yield	-999999	NA
Crop	11	Soybeans	Yield	-999999	NA

Study ID	**201300522802**	**Study Area**	**Fawn Grove**	Area (ha)	111.29	Tillage	Not specified	Cover Crop	Rye
Practice ID	466	Practice Name	WY8889	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Glenelg channery and Elioak silt loam								
Fertilizer	32,820 lb of nitrogen and 9,790 lb of phosphorus were applied during the 3-year management phase								
Comments	This study compares pre-BMP data (water years 1986 and 1987) with post-BMP data (water years 1988 and 1989) on a 275 acre agricultural watershed, where reductions were made in the number of animal units and applied nutrients. This watershed is underlain by non-carbonate rock. Average annual applied N and P were reduced from 30,870 and 8,305 lbs/yr in the pre-BMP period, to 10,940 and 3,263 lbs/yr, respectively, in the post-BMP period. The percent of streamflow due to baseflow changed from 83-85% in the pre-BMP years to 43-68% in the post-BMP years, due to increased rainfall in the post-BMP period.								

Crop	1	Alfalfa	Yield	-999999	NA
Crop	2	Corn	Yield	-999999	NA
Crop	3	Potatoes	Yield	-999999	NA
Crop	4	Soybeans	Yield	-999999	NA
Crop	5	Wheat	Yield	-999999	NA
Crop	6	Alfalfa	Yield	-999999	NA
Crop	7	Corn	Yield	-999999	NA
Crop	8	Rye	Yield	-999999	NA
Crop	9	Soybeans	Yield	-999999	NA
Crop	10	Wheat	Yield	-999999	NA

Test Site ID	Test Site Name
2013007061	**Lee et al. 2003**

Location		Story	IA	US
Study Citation	2003			
	Lee, K.H., T.M. Isenhart, and R.C. Schultz.			
	Sediment and Nutrient Removal in an Established Multi-Species Riparian Buffer			
	J. Soil Water Conserv. 58(1): 1-8.			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0708010504	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication			
	A field plot study; Triplicate plots			
Crops	Corn, Soybeans			
Study Duration	19 months			

Summary

A field plot study was conducted to determine the effectiveness of an established multi-species buffer in trapping sediment, nitrogen, and phosphorus from cropland runoff during natural rainfall events. Triplicate plots were installed in a previously established buffer with a 4.1 by 22.1 m (14 x 73 ft.) cropland source area paired with either no buffer, a 7.1 m (23 ft) switchgrass (Panicurn virgatum L. cv. Cave-n-Rock) buffer, or a 16.3 m (53.5 ft) switchgrass/woody buffer (7.1 m switchgrass/9.2 m woody) located at the lower end of each plot. The switchgrass buffer removed 95% of the sediment, 80% of the total-nitrogen (N), 62% of the nitrate-nitrogen (NO3-N), 78% of the total phosphorus (P), and 58% of the phosphate-phosphorus (PO,-P). The switchgrass/woody buffer removed 97% of the sediment, 94% of the total-N, 85% of the NO3-N, 91% of the total-P, and 80% of the PO,-P in the runoff. There was a significant negative correlation between the trapping effectiveness of the buffers and the intensity and total rainfall of individual storms. While the 7 m (23 ft) switchgrass buffer was effective in removing sediment and sediment-bound nutrients, the added width of the 16.3 m (53.5 ft) switchgrass/woody buffer increased the removal efficiency of soluble nutrients by over 20%. Similar or even greater reductions might have been found if the 16.3 m (53.5 ft) buffer had been planted completely to native warm-season grasses. In this buffer, combinations of the dense, stiff, native warm-season grass and woody vegetation improved the removal effectiveness for the nonpoint source pollutants from agricultural areas.

Study ID	**201300706101**	**Study Area**	**No Buffer**	Area (ha)	0.01	Tillage	Not specified	Cover Crop	Not specified
Practice ID	1	Practice Name	NB	General Practice		Control		Area Type	C
Category	Management	Study Focus	Buffer	Practice Overview		NF-CCN-CN-CS-EN			
Irrigation	NR	Irrig. Descrip.	not reported						
Soils	Soil of the adjacent crop field source area was a Clarion (fine-loamy, mixed, mesic typic Hapludoll) with an average slope of 8% (Dewitt, 1984).								
Fertilizer	not reported								
Comments									

Crop	1	soybean	Yield	-999999
Crop	2	corn	Yield	-999999

Study ID	**201300706102**	**Study Area**	**Switchgrass**	Area (ha)	0.01	Tillage	Not specified	Cover Crop	Not specified
Practice ID	2	Practice Name	SG	General Practice	Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NF-CCN-CN-CS-EB				
Irrigation	NR	Irrig. Descrip.	not reported						
Soils	The soil under the multi-species riparian buffer was a Coland (fine-loamy, mixed, mesic cumulic Haplaquoll), with an average natural slope of 5%. Soil of the adjacent crop field source area was a Clarion (fine-loamy, mixed, mesic typic Hapludoll) with an								
Fertilizer	not reported								
Comments									

Crop	1	soybean	Yield	-999999
Crop	2	corn	Yield	-999999

Study ID	**201300706103**	**Study Area**	**Switchgrass/Woody**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	Not specified
Practice ID	3	Practice Name	SGW	General Practice	Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NF-CCN-CN-CS-EB				
Irrigation	NR	Irrig. Descrip.	not reported						
Soils	The soil under the multi-species riparian buffer was a Coland (fine-loamy, mixed, mesic cumulic Haplaquoll), with an average natural slope of 5%. Soil of the adjacent crop field source area was a Clarion (fine-loamy, mixed, mesic typic Hapludoll) with an								
Fertilizer	not reported								
Comments	Filter Strip/Riparian Buffer								

Crop	1	soybean	Yield	-999999
Crop	2	corn	Yield	-999999

Test Site ID	Test Site Name
2013005238	**Lietman, P. L., 1997a**
Location	Churchtown and Morga, Lancaster/Berks, PA, US
Study Citation	1997 Lietman, P. L. Evaluation of agricultural best management practices in the Conestoga River Headwaters, Pennsylvania: A summary report, 1982-90. U. S. Geological Survey. Water-Supply Paper 2493. Denver, Colorado.
NRCS LRR	Northern Atlantic Slope Diversified Farming Region
NRCS MLRA	Conestoga Headwaters RCWP S
HUC_10	0205030611
Test Site Scale	Watershed
Experimental Design Type/ Description	Before-After pre- and post-BMP
Crops	Corn, alfalfa
Study Duration	

Summary

The USGS studied BMPs in the Conestoga River Headwaters, Pa. for 9 years. (This report incorporates Lietman et al. 1997b)Surface water and groundwater were characterized at three scales – regional (188 sq. mi.), small watershed (5 sq. mi.), and field (22 and 47.5 acres). Only field-scale studies are entered into this BMP database. At the small watershed and field scales, water-quantity and water-quality data collected during the characterization phase were compared with similar data collected after implementation of BMPs. In carbonate parts of the study area, water and associated contaminants move rapidly from the land surface to the groundwater through highly permeable soils and fractured bedrock. Changes in groundwater level and chemistry were frequently found within 1 day of the onset of precipitation. Elevated concentrations of sediment, nutrients, and herbicides in surface water and groundwater reflect the intensive agricultural land use in the carbonate valleys. Pipe-outlet terracing, installed at a 22 acre field site underlain by carbonate rock, was effective in reducing sediment losses from the site, but total nitrogen and phosphorus losses with runoff were not significantly different before and after terracing. Although no measurable overall change in the relative amounts of runoff and recharge resulted from terracing, median concentrations of dissolved nitrate at 4 of 6 groundwater sampling locations increased after terrace installation. Nutrient applications were reduced at a 47.5 acre field site and a 1.4 sq. mi. subbasin of the small watershed after implementation of nutrient-management practices. At the field site, where discharge of dissolved nitrate in groundwater was 98% of the total nitrogen leaving the site with water, dissolved nitrate concentrations in groundwater from most of the sampled wells decreased significantly after implementation of nutrient management. In the 1.4 sq. mi. subbasin, nutrient management was beneficial in preventing increased concentration of dissolved nitrate plus nitrate in the base flow of streams in the subbasin. Findings include that BMPs are most effective if their overall effects on surface and groundwater systems are considered in their design. This consideration is particularly important in areas underlain by carbonate rock, in which groundwater is highly susceptible to contamination by agricultural chemicals applied to the land surface.

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300523801**	**Study Area**	**Field Site 1**	Area (ha)	9.35	Tillage	Conventional	Cover Crop	
Practice ID	560	Practice Name	Field Site 1-Terr	General Practice	Terrace			Area Type	T
Category	Structural	Study Focus	Terrace	Practice Overview	NC-CCN-CN-CO-ET				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Underlain by weathered and fractured carbonate bedrcok. Hagerstown and Duffield silt-clay loams, weathered from limestone. Underlain by dolomitic rocks of Zooks Corner Formation.								
Fertilizer	320 lbs/acre/yr Nitrogen and 82 lbs/acre/yr Phosphorus. A variety of animal manures and some commercial fertilizer. Manures either surface-spread or injected.								
Comments	Six pipe-outlet terraces, designed to accommodate a 5-in., 24-hour storm, were constructed in October and November 1984. Terraces were designed to trap runoff in ponds behind each terrace. The ponded runoff slowly drained into a perforated standpipe in each terrace and left the field through a solid outlet pipe, which extended from the most upgradient terrace to the base of the site. Part of the terracing BMP planned for the site was the establishment of an alfalfa field on the steep slope downgradient from the first terrace. This alfalfa field became established 2 years after terrace construction.								

Crop 1 Corn Yield -999999

Study ID	**201300523802**	**Study Area**	**Field Site 2**	Area (ha)	19.22	Tillage	No-till/Minimum Till	Cover Crop	
Practice ID	561	Practice Name	Field Site 2-NM	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Terrace, Fertilizer	Practice Overview	NM-CCN-NT-CO-ET				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Underlain by weathered and fractured carbonate bedrcok. Hagerstown and Duffield silt-clay loams, weathered from limestone. Underlain by Milbach Formation and Snitz Creek Formation.								
Fertilizer	470 lbs/acre/yr Nitrogen and 100 lbs/acre/yr Phosphorus. A variety of animal manures and some commercial fertilizer. Manures either surface-spread or injected.								
Comments	Terraces had been in place for almost 20 years before this study. Nutrient management resulted in decreased nutrient applications. At Field-Site 2, the average annual nitrogen applications decreased 22%, and phosphorus application decreased 29% from the pre- to the post-BMP period. Nutrient management was generally defined as limiting the application of nitrogen to match expected crop requirements for nitrogen. The nutrient-management recommendations were based on the nitrogen content of manure. Nutrient management plans took into account nutrients available from manure (on the basis of manure analysis), history of manure applications (for estimation of residual nitrogen), and estimated crop yields. Although reduction in manure applications commonly resulted in reduced inputs of phosphorus to the cropland, the phosphorus inputs generally continued to exceed crop requirements.								

Crop 1 Corn Yield -999999

Test Site ID	Test Site Name
2016002001	**Lowrance et al. 2005**

Location		Tift	GA	US
Study Citation	2005			
	Lowrance, R., Sheridan, J. M.			
	Surface Runoff Water Quality in a Managed Three Zone Riparian Buffer			
	Journal of Environmental Quality			
NRCS LRR	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region			
NRCS MLRA	Southern Coastal Plain			
HUC_10	0311020401	Test Site Scale	Plot	
Experimental Design Type/ Description	Inflow-Outflow			
	Inflow, mid practice, and outflow sampling of riparian buffer with three treatments			
Crops	continuous corn, peanut, millet			
Study Duration	4 years			

Summary

The authors measured surface runoff volumes, nutrient concentrations and loads in a riparian buffer system consisting of (moving down slope from the field) a grass strip, a managed forest, and an unmanaged forest. The managed forest consisted of sections of clear-cut, thinned, and mature forest. The mature forest had significantly lower flow-weighted concentrations of nitrate, ammonium, total Kjeldahl N (TKN), sediment TKN, total N (nitrate + TKN), dissolved molybdate reactive P (DMRP), total P, and chloride. Compared with the field output, flow-weighted concentrations of nitrate, ammonium, DMRP, and total P decreased significantly within the buffer and flow-weighted concentrations of TKN, total N, and chloride increased significantly within the buffer. All loads decreased significantly from the field to the middle of the buffer, but most loads increased from the middle of the buffer to the sampling point nearest the stream because surface runoff volume increased near the stream. The average buffer reduced loadings for all nutrient species, from 27% for TKN to 63% for sediment P. The managed forest and grass buffer combined was an effective buffer system.

Study ID	**201600200101**	**Study Area**	**Mature Buffer**	Area (ha)	0.67	Tillage	Conventional (intensive) Tillage	Cover Crop	
Practice ID	1	Practice Name	Mature Buffer	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CEX-EB				
Irrigation	No	Irrig. Descrip.							
Soils	Alapaha loamy sand (fine-loamy, siliceous, acid, thermic Typic Fluvaquents)								
Fertilizer	conventional fertilizer								
Comments	Buffer is comprised of three zones moving downslope to the stream: 1) 8 m grass strip, 2) 45 - 60 m of managed forest, and 3) 15 m of old growth forest								

Crop	1	Continuous Corn	Yield
Crop	2	Peanut	Yield
Crop	3	Millet	Yield

Study ID	**201600200102**	**Study Area**	**Clear Cut**	Area (ha)	0.67	Tillage	Conventional (intensive) Tillage	Cover Crop	
Practice ID	2	Practice Name	Clear Cut	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CEX-EB				
Irrigation	No	Irrig. Descrip.							
Soils	Alapaha loamy sand (fine-loamy, siliceous, acid, thermic Typic Fluvaquents)								
Fertilizer	conventional fertilizer								
Comments	Buffer is comprised of three zones moving downslope to the stream: 1) 8 m grass strip, 2) 45 - 60 m of managed forest, and 3) 15 m of old growth forest								

Crop	4	Continuous Corn	Yield
Crop	5	Peanut	Yield
Crop	6	Millet	Yield

Study ID	**201600200103**	**Study Area**	**Thinned**	Area (ha)	0.67	Tillage	Conventional (intensive) Tillage	Cover Crop	
Practice ID	3	Practice Name	Thinned	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CEX-EB				
Irrigation	No	Irrig. Descrip.							
Soils	Alapaha loamy sand (fine-loamy, siliceous, acid, thermic Typic Fluvaquents)								
Fertilizer	conventional fertilizer								
Comments	Buffer is comprised of three zones moving downslope to the stream: 1) 8 m grass strip, 2) 45 - 60 m of managed forest, and 3) 15 m of old growth forest								

Crop	7	Continuous Corn	Yield
Crop	8	Peanut	Yield
Crop	9	Millet	Yield

Test Site ID	Test Site Name
2016001006	**Nangia et al. 2007**

Location		Nicollet	MN	US
Study Citation	2007			
	Nangia, V., Gowda, P.H., Mulla, D.J., Sands, G.R.			
	Water Quality Modeling of Fertilizer Management Impacts on Nitrate Losses in Tile Drains at the Field Scale			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0702000708	Test Site Scale	Field	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
Crops	Corn-soybean-oats-alfalfa			
Study Duration	12 years			

Summary

This paper evaluates the effect of fertilizer rate and timing on nitrate losses in two (East and West) commercial row crop fields located in south-central Minnesota. The Agricultural Drainage and Pesticide Transport (ADAPT) model was calibrated and validated for monthly subsurface tile drain flow and nitrate losses for a period of 1999-2003. The calibrated model was then used to evaluate the effects of rate and timing of fertilizer application on nitrate losses with a 50-yr climatic record.

Study ID	**201600100601**	**Study Area**	**East Field**	Area (ha)	9.31	Tillage	chisel-cultivator-planter; conservation tillage	Cover Crop	
Practice ID	1	Practice Name	East Field	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Soils in the study area included Cordova (TypicArgiaquolls), Cordova-Rolfe (Typic Argialbolls), Canisteo (Typic Haplaquolls), Le Sueur (AquicArgiudolls), Harps (Typic Calciaquolls) and Okoboji (Cumulic Haplaquolls).								
Fertilizer									
Comments									

Crop	1	Soybean	Yield
Crop	2	Corn	Yield
Crop	3	Soybean	Yield
Crop	4	Corn	Yield

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Crop	5	Soybean	Yield
Crop	6	Corn	Yield
Crop	7	Soybean	Yield
Crop	8	Corn	Yield
Crop	9	Corn	Yield
Crop	10	Corn	Yield
Crop	11	Corn	Yield
Crop	12	Soybean	Yield

Study ID	**201600100602**	**Study Area**	**West Field**	Area (ha)	11.01	Tillage	chisel-cultivator-planter; conservation tillage	Cover Crop	Oats/Alfalfa
Practice ID	2	Practice Name	West Field	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Soils in the study area included Cordova (TypicArgiaquolls), Cordova-Rolfe (Typic Argialbolls), Canisteo (Typic Haplaquolls), Le Sueur (AquicArgiudolls), Harps (Typic Calciaquolls) and Okoboji (Cumulic Haplaquolls).								
Fertilizer									
Comments									

Crop	13	Soybean	Yield
Crop	14	Corn	Yield
Crop	15	Soybean	Yield
Crop	16	Corn	Yield
Crop	17	Corn	Yield
Crop	18	Soybean	Yield
Crop	19	Corn	Yield
Crop	20	Oats/Alfalfa	Yield
Crop	21	Alfalfa	Yield
Crop	22	Alfalfa	Yield

Crop	23	Corn	Yield
Crop	24	Soybean	Yield

Test Site ID	Test Site Name
2016002012	**Oquist et al., 2007**

Location		Redwood	MN	US
Study Citation	2007			
	Oquist, K. A., Strock, J. S., Mulla, D. J.			
	Influence of Alternative and Conventional Farming Practices on Subsurface Drainage and Water Quality			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0702000804	Test Site Scale	Field	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
Crops	Corn, Soybean, Small grains, Alfalfa, and Native grasses			
Study Duration	3 years			

Summary

The study examined the effects of both alternative and conventional farming practices on subsurface drainage and nitrogen and phosphorus loss through subsurface drainage from glacial till soils in southwest Minnesota. Alternative farming practices included organic management practices, species biodiversity, and/or practices that include reduced inputs of synthetic fertilizer and pesticides. Conventional farming practices include corn–soybean (Zea mays L.–Glycine max L., respectively) rotations and their associated recommended fertilizer rates as well as pesticide usage. Results indicate that alternative farming practices reduced subsurface drainage discharge by 41% compared with conventional practices. Flow-weighted mean nitrate-nitrogen (nitrate N) concentrations during tile flow were 8.2 and 17.2 mg/L under alternative and conventional farming practices, respectively. Alternative farming practices reduced nitrate N losses by between 59 and 62% in 2002 and 2004 compared with conventional practices. Results suggest that alternativefarming practices have the potential to reduce agricultural impacts on water quality.

Study ID	**201600201201**	**Study Area**	**Alternative**	Area (ha)	64.99	Tillage	"chisel, moldboard plow, and no-till"--assumed NT for ALT site	Cover Crop	
Practice ID	1	Practice Name	Alternative	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Fertilizer, Crop Rotation	Practice Overview	NM-CCN-NT-CSX-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Soils formed in glacial till including Webster (Typic Endoaquolls, 21.2 ha) and Revere (Typic Calciaquolls, 6.1 ha) clay loams, Okoboji (Cumulic Vertic Endoaquolls, 2.4 ha) silty clay loam, Ves (Calcic Hapludolls, 15.7 ha), Storden (Typic Eutrudepts, 1.7								
Fertilizer	Increased crop rotation including legume crops. Reduced nitrogen inputs and use of manure.								
Comments	Field scale study with multiple crop zones within the field, collectively labeled alternative.								

Crop	1	Corn	Yield
Crop	2	Soybean	Yield
Crop	3	Small grains	Yield
Crop	4	Alfalfa	Yield

Crop	5	Native Grasses	Yield
Crop	11	Corn	Yield
Crop	12	Soybean	Yield
Crop	13	Small grains	Yield
Crop	14	Alfalfa	Yield
Crop	15	Native Grasses	Yield
Crop	21	Corn	Yield
Crop	22	Soybean	Yield
Crop	23	Small grains	Yield
Crop	24	Alfalfa	Yield
Crop	25	Native Grasses	Yield

Study ID	**201600201202**	**Study Area**	**Conventional**	Area (ha)	64.99	Tillage	"chisel, moldboard plow, and no-till"-assumed CN for CONV site	Cover Crop	
Practice ID	2	Practice Name	Conventional	General Practice	Control			Area Type	C
Category	Management	Study Focus	Fertilizer, Crop Rotation	Practice Overview	NC-CCN-CN-CS-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Soils formed in glacial till including Webster (Typic Endoaquolls, 17.8 ha) and Revere (Typic Calciaquolls, 3.6 ha) clay loams, Ves (Calcic Hapludolls, 14.9 ha), Storden (Typic Eutrudepts, 0.1 ha), and Normania (Aquic Hapludolls, 28.5 ha) loams, and Esth								
Fertilizer	Corn-soybean rotation. Use of synthetic fertilizers.								
Comments									

Crop	6	Corn	Yield
Crop	7	Soybean	Yield
Crop	8	Small grains	Yield
Crop	9	Alfalfa	Yield
Crop	10	Native Grasses	Yield
Crop	16	Corn	Yield
Crop	17	Soybean	Yield

Crop	18	Small grains	Yield
Crop	19	Alfalfa	Yield
Crop	20	Native Grasses	Yield
Crop	26	Corn	Yield
Crop	27	Soybean	Yield
Crop	28	Small grains	Yield
Crop	29	Alfalfa	Yield
Crop	30	Native Grasses	Yield

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013001001	**Padova University Farm**

Location			XX	IT

Study Citation	2005
	Borina, Maurizio; Monica Vianelloa, Francesco Moraria, Giuseppe Zanin
	Effectiveness of buffer strips in removing pollutants in runoff from a cultivated field in North-East Italy
NRCS LRR	Italy
NRCS MLRA	Italy
HUC_10	-999999
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	Plot/Control Study; field experiment
Crops	Corn, Soybeans, Wheat
Study Duration	4 years

Summary

The effect of a 6 m buffer strip (BS) in reducing runoff, suspended solids and nutrients from a field growing maize, winter wheat and soybean was assessed in a field experiment conducted in North-East Italy during 1998–2001. The BS was composed of two rows of regularly alternating trees (Platanus hybrida Brot.) and shrubs (Viburnum opulus L.), with grass (Festuca arundinacea L.) in the inter-rows. The BS reduced total runoff by 78% compared to no-BS, in which cumulative runoff depth was 231 mm over 4 years. With no-BS, runoff appeared to be influenced mostly by total rainfall, while with BS maximum rainfall intensity was more important.Thee BS reduced TSS, particularly after the second year, when the median yearly concentrations ranged from 0.28 to 0.99 mg/L and were smaller than 0.14 mg/L, with no-BS and with BS respectively. The combination of lower concentrations and runoff volumes significantly reduced TSS losses from 6.9 to 0.4 t/ha over the entire period. A tendency to increased concentrations of all forms of N (total, nitrate and ammonium) while passing through the BS was observed, but total N losses were reduced from 17.3 to 4.5 kg/ha in terms of mass balance. On the contrary, P concentrations were unmodified (soluble P), or lowered (total P) by the BS, reducing total losses by about 80%. The effect on total P, composed mainly of sediment-bound forms, was related to particulate settling when passing through the BS. A numerical index (Eutrophic Load Index), integrating water quality and runoff volumes, was created to evaluate the eutrophication risk of runoff with or without the BS. It showed that the BS effect was mostly due to a reduction of runoff volumes rather than improving the overall water quality.

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300100101**	**Study Area**	**Field with BS**	Area (ha) -99.00	Tillage	Not specified	Cover Crop None
Practice ID	1	Practice Name	Buffer Strip	General Practice	Filter Strip		Area Type T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CS-EB		
Irrigation	No	Irrig. Descrip.	Not applicable				
Soils	Per FAO-UNESCO (1990): soil is fulvi-calcaric Cambisol, with loamy texture in upper 80 cm; sand percentage gradually increases with depth, reaching 50–60% at 1–1.4 m. Soil infiltration rates varied from 2.8x10^-3 cm/s in avg. conditions to 2.7x10^-4 cm/s						
Fertilizer	Fertilizer treatment (kg/ha) 6 November 1997: 32 N, 20 P5 March 1998: 150 N14 April 1999: 32 N, 20 P31 May 1999: 150 N27 April 2000: 32 N, 20 P24 May 2000: 150 N25 October 2000 : 32 N, 20 P19 February 2001: 100 N3 July 2001: 16 N, 10 P						
Comments	The experimental site is a rectangular field, with a 35 m long 1.8% slope downwards to a ditch. The BS studied in this paper was composed of two rows of regularly alternating trees (Platanus hybrida Brot.) and shrubs (Viburnum opulus L.) planted in spring 1997. The two rows were 1.5 and 4.5 m from the ditch, planted 2 m apart in the center of 1.2 m wide ethylenevinyl acetate (EVA) film. Festuca arundinacea L. was sown at a density of 30 kg/ha on the remaining area to form grass cover. Each treatment had two replicates.						

Crop	1	Winter Wheat	Yield	-999999
Crop	2	Maize	Yield	-999999
Crop	3	Maize	Yield	-999999
Crop	4	Winter Wheat	Yield	-999999
Crop	5	Soybean	Yield	-999999

Study ID	**201300100102**	**Study Area**	**Field without BS**	Area (ha) -99.00	Tillage	Not specified	Cover Crop None
Practice ID	2	Practice Name	Control	General Practice	Control		Area Type C
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CS-EN		
Irrigation	No	Irrig. Descrip.	Not applicable				
Soils	Per FAO-UNESCO (1990): soil is fulvi-calcaric Cambisol, with loamy texture in upper 80 cm; sand percentage gradually increases with depth, reaching 50–60% at 1–1.4 m. Soil infiltration rates varied from 2.8x10^-3 cm/s in avg. conditions to 2.7x10^-4 cm/s						
Fertilizer	Fertilizer treatment (kg/ha) 6 November 1997: 32 N, 20 P5 March 1998: 150 N14 April 1999: 32 N, 20 P31 May 1999: 150 N27 April 2000: 32 N, 20 P24 May 2000: 150 N25 October 2000 : 32 N, 20 P19 February 2001: 100 N3 July 2001: 16 N, 10 P						
Comments							

Crop	6	Winter Wheat	Yield	-999999
Crop	7	Maize	Yield	-999999
Crop	8	Maize	Yield	-999999
Crop	9	Winter Wheat	Yield	-999999

Crop	10	Soybean	Yield	-999999

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2016001003	**Pederson et al. 2010**

Location		Floyd	IA	US
Study Citation	2010			
	Pederson, C.H., Kanwar, R.S., Helmers, M.J., Mallarino, A.P.			
	Impact of Liquid Swine Manure Application and Cover Crops on Ground Water Quality			
	Iowa State Research Farm Progress Reports			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Eastern Iowa and Minnesota Till Prairies			
HUC_10	0708020112	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
Crops	Corn, soybean, rye			
Study Duration	4 years			

Summary

The primary objective of this project was to determine the impact of appropriate rates of swine manure applications to corn and soybeans based on nitrogen and phosphorus requirements of crops, soil phosphorus accumulation, and the potential of nitrate and phosphorus leaching to groundwater. Another purpose of this long-term experimental study was to develop and recommend appropriate manure and nutrient management practices to producers to minimize water contamination potential and enhance the use of swine manure as fertilizer. A third component of this study was to determine the potential effects of rye as a cover crop to reduce nitrate loss to shallow groundwater.

Study ID	**201600100301**	**Study Area**	**1**	Area (ha)	0.40	Tillage	Chisel plow, Field Cultivate	Cover Crop	
Practice ID	1	Practice Name	1 - SpUAN	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview	NM-CCN-CT-CS-EN				
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Spring UAN 150 lb N/ac (C-S)								
Comments									

Crop	1	Corn	Yield	203.8	bu/Acre
Crop	2	Soybean	Yield	62	bu/Acre

Study ID	**201600100302**	**Study Area**	**2**	Area (ha)	0.40	Tillage	Chisel plow, Field Cultivate	Cover Crop	
Practice ID	2	Practice Name	2 - FMan150	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NC-CCN-CT-CS-EN			
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Fall manure 150 lb N/ac (C-S)								
Comments									

Crop	3	Corn	Yield	185.2	bu/Acre
Crop	4	Soybean	Yield	66.4	bu/Acre

Study ID	**201600100303**	**Study Area**	**3**	Area (ha)	0.40	Tillage	Chisel plow, Field Cultivate	Cover Crop	
Practice ID	3	Practice Name	3 - FMan150/100	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NC-CCN-CT-CS-EN			
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Fall manure 150 lb N corn & 100 lb N Soybean (C-S)								
Comments									

Crop	5	Corn	Yield	193.4	bu/Acre
Crop	6	Soybean	Yield	66.8	bu/Acre

Study ID	**201600100304**	**Study Area**	**4.1**	Area (ha)	0.40	Tillage	Chisel plow	Cover Crop	
Practice ID	4	Practice Name	4.1 - FMan200	General Practice		Nutrient Management		Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview		NC-CCN-CT-CO-EN			
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Fall manure 200 lb N/ac (C-C)								
Comments									

Crop	7	Corn	Yield	166.4	bu/Acre

Study ID	**201600100305**	**Study Area**	**4.2**	Area (ha)	0.40	Tillage	Chisel plow	Cover Crop	
Practice ID	5	Practice Name	4.2 - FMan200SR	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Fall manure 200 lb N/ac + Stover removal (C-C)								
Comments									

Crop	8	Corn	Yield	167.3	bu/Acre

Study ID	**201600100306**	**Study Area**	**5**	Area (ha)	0.40	Tillage	NT	Cover Crop	Ryegrass
Practice ID	6	Practice Name	5 - SpUANRR	General Practice	Nutrient Management, Conservation Tillage, Cover Crop			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview	NM-CCY-NT-CS-EN				
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Spring UAN 150 lb N/ac + Rye removal								
Comments									

Crop	9	Corn	Yield	180.8	bu/Acre
Crop	10	Soybean	Yield	56.4	bu/Acre

Study ID	**201600100307**	**Study Area**	**6**	Area (ha)	0.40	Tillage	NT	Cover Crop	
Practice ID	7	Practice Name	6 - FMan150	General Practice	Nutrient Management, Conservation Tillage			Area Type	T
Category	Management	Study Focus	Cover Crop, Fertilizer	Practice Overview	NC-CCN-NT-CS-EN				
Irrigation		Irrig. Descrip.	No data.						
Soils									
Fertilizer	Fall manure 150 lb N/ac (C-S)								
Comments									

Crop	11	Corn	Yield	162.4	bu/Acre
Crop	12	Soybean	Yield	64.1	bu/Acre

Test Site ID	Test Site Name
2013005334	**Peterjohn, W. T., 1996**

Location	Edgewater	Anne Arundel	MD	US
Study Citation	1986			
	Peterjohn, W.T. and D.L. Correll.			
	The effect of riparian forest on the volume and chemical composition of baseflow in an agricultural watershed.			
	In: D. L. Correll (ed.) Watershed research perspectives. Smithsonian Institution Press: Washington, DC.			
NRCS LRR	Northern Atlantic Slope Diversified Farming Region			
NRCS MLRA	Northern Appalachian Ridges and Valleys			
HUC_10	0206000403	Test Site Scale	Farm	
Experimental Design Type/ Description	Inflow-Outflow (Downstream)			
	Groundwater inflow through a riparian buffer compared to instream water quality downstream of buffer. Groundwater compared to downstream water quality.			
Crops	Corn, tobacco			
Study Duration	2 years			

Summary

For two years the nutrient, chloride, and hydronium ion concentrations in groundwater leaving agricultural fields and entering an adjacent riparian forest were compared to the chemical concentrations in stream water draining the riparian forest under baseflow conditions. Yearly mean nitrate-N concentrations decreased by approximately 4 mg/L whereas the chloride concentration increased by 3 mg/L due to evapotranspiration. The yearly mean pH increased by approximately one pH unit. The volumes of precipitation and baseflow were used in conjunction to estimate an annual water budget for the riparian forest. The water budget, in turn, was used with the chemical compositions of precipitation, groundwater, and baseflow to calculate the change in the chemical load in groundwater moving through the riparian forest. From this study, a riparian forest in a coastal plain agricultural watershed: (a) acted as a important sink for nitrate-N; (b) significantly reduced the acidity of the groundwater and precipitation which enters it.

Study ID	**201300533401**	**Study Area**	**Lamberton**	Area (ha)	16.31	Tillage	Not specified	Cover Crop	None
Practice ID	704	Practice Name	Rip Buffer	General Practice	Riparian Buffer			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-CN-CEX-EB				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	non-calcareous fine sandy loam								
Fertilizer									
Comments	This 40.3-ac watershed has an average basin slope of 5.44%, and includes 14.6-ac of hedgerows and riparian forest, which completely surround the stream draining the watershed. Stream water discharge was measured and weekly volume-integrated stream samples were taken at a v-notch weir. Seven wells in two clusters in the first year and 10 wells in two clusters in the second year were sampled to calculate inflow to the forest buffer. The first year was 03/81 through 02/82, while the second year was measured as 03/84 through 02/85.								

Crop	1	corn, tobacco	Yield	-999999	NA
Crop	2	corn, tobacco	Yield	-999999	NA

Test Site ID	Test Site Name
2016002014	**Randall and Vetsch, 2005**

Location		Waseca	MN	US
Study Citation	2005			
	Randall, G. W., Vetsch, J. A.			
	Nitrate Losses in Subsurface Drainage from a Corn-Soybean Rotation as Affected by Fall and Spring Application of Nitrogen and Nitrapyrin			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0702001101	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	The effects of fall and spring applications of anhydrous ammonia with and without nitrapyrin were analyzed with a randomized complete-block design with four replications and restricted randomization. 32 plots: 16 corn and 16 soybean each year.			
Crops	Corn-Soybean			
Study Duration	7 years			

Summary

A field study was conducted from the fall of 1993 through 2000 on a tile-drained Canisteo clay loam soil to determine the influence of fall vs. spring application of N and nitrapyrin on NO3 losses from a corn (Zea mays L.)-soybean [Glycine max (L.) Merr.] rotation. Four anhydrous ammonia treatments (fall N, fall N + NP, spring preplant N, and spring N + NP) were replicated four times and applied at 135 kg N ha?1 for corn on individual drainage plots. Annual flow-weighted NO3-N concentrations for the fall, fall + NP, spring, and spring + NP treatments averaged 14.3, 11.5, 10.7, and 11.3 mg L?1 during the corn phase but annual NO3-N concentrations were still ?10 mg L?1 in three of six years for the spring preplant treatment. Averaged across the six rotation cycles, flow-normalized NO3-N losses ranked in the order: fall N > spring N + NP > fall N + NP > spring N. Under these conditions, NO3 losses in subsurface drainage from a corn-soybean rotation can be reduced 14% by spring N and 10% by late fall N + NP compared with fall-applied N. Nitrate losses were not appreciably reduced by adding NP to spring preplant N.

Study ID	**201600201401**	**Study Area**	**Fall Fert. Application - Corn**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	1	Practice Name	Fall Fert. Application - Corn	General Practice		Nutrient Management		Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCN-UT-CS-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								

Crop 1 Corn Yield

Study ID	**201600201402**	**Study Area**	**Fall Fert. Application - Soybean**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	2	Practice Name	Fall Fert. Application - Soybean	General Practice	Nutrient Management			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								
Crop	2	Soybean		Yield					

Study ID	**201600201403**	**Study Area**	**Fall Fert. Application w/ Nitrapyrin - Corn**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	3	Practice Name	Fall Fert. Application w/ Nitrapyrin - Corn	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								
Crop	3	Corn		Yield					

Study ID	**201600201404**	**Study Area**	**Fall Fert. Application w/ Nitrapyrin - Soybean**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	4	Practice Name	Fall Fert. Application w/ Nitrapyrin - Soybean	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								
Crop	4	Soybean		Yield					

Study ID	**201600201405**	**Study Area**	**Spring Fert. Application - Corn**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	5	Practice Name	Spring Fert. Application - Corn	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								

Crop 5 Corn Yield

Study ID	**201600201406**	**Study Area**	**Spring Fert. Application - Soybean**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	6	Practice Name	Spring Fert. Application - Soybean	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								

Crop 6 Soybean Yield

Study ID	**201600201407**	**Study Area**	**Spring Fert. Application w/ Nitrapyrin - Corn**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	7	Practice Name	Spring Fert. Application w/ Nitrapyrin - Corn	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								

Crop 7 Corn Yield

Study ID	**201600201408**	**Study Area**	**Spring Fert. Application w/ Nitrapyrin - Soybean**	Area (ha)	0.02	Tillage	Not specified	Cover Crop	
Practice ID	8	Practice Name	Spring Fert. Application w/ Nitrapyrin - Soybean	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Canisteo clay loam soil (fine-mixed, superactive, calcareous, mesic Typic Endoaquoll)								
Fertilizer									
Comments	Fertilizer only applied in corn years.								

Crop	8	Soybean	Yield

Test Site ID	Test Site Name
2013005352	**Randall, G. W., 1990**

Location	Waseca	Waseca	MN	US
Study Citation	1990			
	Randall, G. W.			
	Nitrate-N in the soil profile and tile drainage water as influenced by tillage.			
	Am. J. Ind. Med. 18:457-460.			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Till Plains			
HUC_10	0704000202	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control			
	plot study with replications			
Crops	Corn			
Study Duration	5 years			

Summary

Conservation tillage systems facilitate the infiltration of greater amounts of precipitation into the soil profile by reducing surface runoff. Some scientists are concerned that higher infiltration and percolation rates are often linked to potentially higher leaching losses of agricultural chemicals. Soil samples were taken in 1 ft increments to a depth of 5 ft to ascertain the accumulation and distribution of nitrate nitrogen (NO3-N) in the soil profile as influenced by tillage. Two long-term tillage studies on fine-textured, clay loam soils were sampled in July and November 1977 following 2 years of limited rainfall. Nitrate-N accumulation in the 0 to 3 ft profile in late July was reduced by 75% (no tillage) to 38% (chisel plow) compared with the conventional moldboard tillage system in this 8-year study. Accumulation in the 0 to 5 ft profile after harvest was 751, 546, 345, and 198 lb NO3-N/A for the moldboard plow, chisel-plow, disk-, and no-tillage systems, respectively. Another 3 year study showed accumulations of 625, 619, 468, and 391 pounds NO3-N/A after harvest with the moldboard plow, ridge-plant, chisel-plow, and no-tillage systems, respectively. These data indicate that tillage can have substantial effects on the accumulation of NO3 in soils and that additional research is needed to determine the mechanisms responsible for these differences.

Study ID	**201300535201**	**Study Area**	**Waseca-MB**	Area (ha)	-99.00	Tillage	Conventional	Cover Crop	None
Practice ID	721	Practice Name	Mbplow	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.	natural rainfall						
Soils	Webster clay loam								
Fertilizer	Nitrogen applied at 180 pounds N/A as ammonium nitrate was spring-applied annually to continuous corn on this clay loam site.								
Comments	This tile drainage plot study reports results for four different treatments over 15 years at the Southern Minnesota Research Station. The data included in this database was for only two of those treatments - moldboard plowing and no-tillage over the 5-year period from 1982-1986. Nitrogen was spring-applied at 180 lbs of N/ac as ammonium nitrate annually to continuous corn on these plots.								

Crop 1 continuous corn Yield 134 bushels/acre

Study ID	**201300535202**	**Study Area**	**Waseca_NT**	Area (ha)	-99.00	Tillage	No Till	Cover Crop	None
Practice ID	722	Practice Name	NT	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCN-NT-CO-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Webster clay loam								
Fertilizer	Nitrogen applied at 180 pounds N/A as ammonium nitrate was spring-applied annually to continuous corn on this clay loam site.								
Comments	This tile drainage plot study reports results for four different treatments over 15 years at the Southern Minnesota Research Station. The data included in this database was for only two of those treatments - moldboard plowing and no-tillage over the 5-year period from 1982-1986. Nitrogen was spring-applied at 180 lbs of N/ac as ammonium nitrate annually to continuous corn on these plots.								

Crop	1	continuous corn	Yield	128	bushels/acre

Test Site ID	Test Site Name
2013005353	**Randall, G. W., 1995**

Location	Waseca	Waseca	MN	US

Study Citation	1995
	Randall, G. W. and T. K. Iragavarapu.
	Impact of long-term tillage systems for continuous corn on nitrate leaching to tile drainage.
	J. Environ. Qual. 24:360-366.
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Till Plains
HUC_10	0704000202
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	plot study: complete randomized block; subsurface
Crops	Corn
Study Duration	11 years

Summary

An 11 year study was conducted to assess the long term nitrate losses to subsurface tile drainage for corn with continuous conventional tillage and no-till. Information is lacking on the long-term impact of tillage systems on NO3 losses to surface and groundwater. An 11-yr (1982-1992) study was conducted to assess NO3 losses to subsurface, tile drainage for corn (Zea mays L.) grown with continuous conventional tillage (CT) and no tillage (NT) on a poorly drained Webster clay loam soil (fine-loamy, mixed, mesic Typic Haplaquoll) at Waseca, MN. Nitrogen was applied at an annual application rate of 200 kg/ha. Mean annual subsurface drain flow during the 11-yr period was 35 mm higher for NT (315 mm) compared with CT (280 mm). Flow-weighted nitrate-nitrogen (NO3-N) concentrations increased dramatically in the wet years (1990 and 1991) following the dry period of 1987 to 1989. Flow-weighted NO3-N concentrations during the 11-yr period averaged 13.4 and 12.0 mg/L for CT and NT, respectively. Although subsurface drain flow was 12% higher with NT, NO3-N losses were about 5% higher with CT mainly due to higher NO3-N concentrations with CT in the last 2 yr. Corn grain yields and N removal were significantly higher in 6 out of 11 yr with CT compared with NT with no difference between tillage systems in the other 5 yr. Grain yields averaged 8.6 Mg/Ha with CT and 7.3 Mg/ha with NT during the 11-yr period. Multiple regression equations showed that annual flow-weighted NO3-N concentration is best predicted from residual soil NO3 in the 0- to 1.2-m profile and spring rainfall while NO3-N flux can be predicted well from May to June rainfall. Results from this long-term study indicate that on this poorly drained soil, CT had a positive effect on corn grain yield and N removal compared with NT, but tillage systems had minimal impact on NO3 losses to subsurface drain flow. Higher drain flow with NT does not necessarily result in higher NO3-N fluxes lost via subsurface drainage.

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300535301**	**Study Area**	**CT**	Area (ha)	0.02	Tillage	Conventional	Cover Crop	None
Practice ID	723	Practice Name	CT	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NM-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Webster clay loam (Typic Haplaquoll)								
Fertilizer	Fertilizer N as ammonium nitrate was broadcast-applied at a rate of 200 kg N/ha (the recommended N rate for continuous corn on this soil) each spring before planting. Fertilizer P and K were not applied due to the high soil test levels of these nutrients. Insecticide was applied in a band over the corn row to control soil-borne insects. Weeds were controlled extremely well with a preemergence broadcast-application of herbicides.								
Comments	Eight tile-drained plots - each 13.5 x 15m - were used in this study to compare the nitrate loading impacts of conventional tillage (CT) with no-tillage (NT). Corn was planted annually on the entire experimental area. The two treatments were replicated 4 times each, with tillage treatments assigned within each replication to minimize the effect of spatial hydrologic flow variation on drainage flow from the two systems. Fertilizer N was broadcast applied at the recommended rate (200 kg N/ ha) annually. Daily flow rates were determined each weekday by measuring the amount of water flowing in each tile drain during a 1-min interval and converting to L/day. Water quality samples were taken up to 3 times a week (Mon, Wed, and Fri) so long as tile flow exceeded 30 mL/min. Flow-weighted mean NO3-N concentrations were calculated on a daily and annual basis.								

Crop	1	Continuous Corn	Yield	9.2	Mg/ha
Crop	2	Continuous Corn	Yield	6.6	Mg/ha
Crop	3	Continuous Corn	Yield	7.4	Mg/ha
Crop	4	Continuous Corn	Yield	10.1	Mg/ha
Crop	5	Continuous Corn	Yield	9	Mg/ha
Crop	6	Continuous Corn	Yield	9.9	Mg/ha
Crop	7	Continuous Corn	Yield	6.3	Mg/ha
Crop	8	Continuous Corn	Yield	9.6	Mg/ha
Crop	9	Continuous Corn	Yield	9.2	Mg/ha
Crop	10	Continuous Corn	Yield	10.2	Mg/ha
Crop	11	Continuous Corn	Yield	7.6	Mg/ha

Study ID	**201300535302**	**Study Area**	**NT**	Area (ha)	0.02	Tillage	No Till	Cover Crop	None
Practice ID	724	Practice Name	NT	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	No	Irrig. Descrip.							

Soils: Webster clay loam (Typic Haplaquoll)

Fertilizer: Fertilizer N as ammonium nitrate was broadcast-applied at a rate of 200 kg N/ha (the recommended N rate for continuous corn on this soil) each spring before planting. Fertilizer P and K were not applied due to the high soil test levels of these nutrients. Insecticide was applied in a band over the corn row to control soil-borne insects. Weeds were controlled extremely well with a preemergence broadcast-application of herbicides.

Comments: Eight tile-drained plots - each 13.5 x 15m - were used in this study to compare the nitrate loading impacts of conventional tillage (CT) with no-tillage (NT). Corn was planted annually on the entire experimental area. The two treatments were replicated 4 times each, with tillage treatments assigned within each replication to minimize the effect of spatial hydrologic flow variation on drainage flow from the two systems. Fertilizer N was broadcast applied at the recommended rate (200 kg N/ ha) annually. Daily flow rates were determined each weekday by measuring the amount of water flowing in each tile drain during a 1-min interval and converting to L/day. Water quality samples were taken up to 3 times a week (Mon, Wed, and Fri) so long as tile flow exceeded 30 mL/min. Flow-weighted mean NO3-N concentrations were calculated on a daily and annual basis.

Crop	1	Continuous Corn	Yield	9	Mg/ha
Crop	2	Continuous Corn	Yield	6.4	Mg/ha
Crop	3	Continuous Corn	Yield	6.7	Mg/ha
Crop	4	Continuous Corn	Yield	9.1	Mg/ha
Crop	5	Continuous Corn	Yield	8.5	Mg/ha
Crop	6	Continuous Corn	Yield	9.6	Mg/ha
Crop	7	Continuous Corn	Yield	5.2	Mg/ha
Crop	8	Continuous Corn	Yield	8	Mg/ha
Crop	9	Continuous Corn	Yield	6.6	Mg/ha
Crop	10	Continuous Corn	Yield	7.6	Mg/ha
Crop	11	Continuous Corn	Yield	4	Mg/ha

Test Site ID	Test Site Name
2013005354	**Randall, G. W., 1997**
Location	Lamberton, Redwood, MN, US
Study Citation	1997
	Randall, G. W., D. R. Huggins, M. P. Russelle, D. J. Fuchs, W. W. Nelson and J. L. Anderson.
	Nitrate losses through subsurface tile drainage in Conservation Reserve Program, alfalfa, and row crop systems.
	J. Environ. Qual. 26:1240-1247.
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Till Plains
HUC_10	0702000804
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication
	plot study: complete randomized block; edge of field
Crops	Continuous Corn, Corn-Soybean Rotation, Alfalfa, CRP
Study Duration	6 years

Summary

A 6 year study to determine the NO3 losses to subsurface tile drainage under different cropping systems, focusing on perennial crops used in CRP. Four cropping systems were: continuous corn, corn-soybean, alfalfa, and CRP. The four cropping systems were established in 1988 to determine aboveground biomass yields, N uptake, residual soil N (RSN), soil water content, and NO3 losses to subsurface tile drainage water as influenced by cropping system. Hydrologic year rainfall during the 6-yr study ranged from 23% below normal to 66% above normal. In dry years, yields were limited, RSN accumulated at elevated levels in all crop systems but especially in the row-crop systems, soil water reserves and RSN were reduced to as deep as 2.7 m in the alfalfa (Medicago sativa L.) and CRP systems, and tile drainage did not occur. Drainage occurred only in the corn (Zea mays L.) and soybean [Glycine max (L.) Merr.] systems in the year of normal rainfall. In years of excess precipitation, drainage from the row-crop systems exceeded that from the perennial crops by 1.1 to 5.3X. Flow-weighted average NO3-N concentrations in the water during the flow period of this study ere continuous corn = 32, corn-soybean rotation = 24, alfalfa = 3 and CRP = 2 mg/L. Nitrate losses in the subsurface drainage water for the continuous corn and corn-soybean systems were about 37X and 35X higher, respectively, than from the alfalfa and CRP systems due primarily to greater season-long ET resulting in less drainage and greater uptake and/or immobilization of N by the perennial crops.Descp. From MN Dbase: Corn was planted annually in the entire study area starting in 1973. Nitrogen was not applied to corn in the 8 years prior to the study. In the spring of 1988 after secondary tillage, the cropping systems (continuous corn (CC), corn after soybean (C_Sb), soybean after corn (Sb_C), alfalfa, and CRP) were established and replicated three times in a randomized complete block design. Annual N application rates for corn were determined from the nitrate-nitrogen content in soil samples, previous crop (corn or soy), and a yield goal of 8800 kg/ha.

Study ID	**201300535401**	**Study Area**	**Continuous Corn**	Area (ha)	0.02	Tillage	Conventional (Moldboard plow)	Cover Crop	None
Practice ID	1	Practice Name	Continuous Corn	General Practice	Control			Area Type	C
Category	Management	Study Focus	CRP, Crop Rotations	Practice Overview	NC-CCN-CN-CO-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Normania clay loam (Aquic Haplustoll)								
Fertilizer	Annual N application rates for corn were determined from the NO3-N content in soil samples taken to a 1.2 m depth in April, previous crop (corn or soybean), and a yield goal of 8800 kg/ha. Urea was broadcast applied for corn each spring and incorporated within 24h by cultivation. Fertilizer P and K were not applied to the corn, soybean, or CRP plots because of very high soil tests for the nutrients.								
Comments	Subsurface tile drainage systems were used on 15 individual 13.7 x 15.3 m plots with separate drain outlets in this study. Four different treatments were used in this study. Two of these were applicable to this database - continuous corn (CC) and areas planted to the Conservation Reserve Program (CRP). Three replicates of each treatment were used. After a single disking, the CRP plots were planted to a mixture of alfalfa, smooth bromegrass, orchardgrass, and timothy, interseeded with a companion crop of oats. Annual N application rates for corn were determined from soil N tests, the previous crop and a yield goal of 8800 kg/ha. No N was applied to the CRP plots.								

Crop	1	Continuous Corn	Yield	2730	dry matter, kg/h
Crop	2	Continuous Corn	Yield	5880	dry matter, kg/h
Crop	3	Continuous Corn	Yield	6370	dry matter, kg/h
Crop	4	Continuous Corn	Yield	7780	dry matter, kg/h
Crop	5	Continuous Corn	Yield	8280	dry matter, kg/h
Crop	6	Continuous Corn	Yield	5180	dry matter, kg/h

Study ID	**201300535402**	**Study Area**	**Corn after soybean**	Area (ha)	0.02	Tillage	Conventional (Moldboard plow)	Cover Crop	None
Practice ID	2	Practice Name	Corn after soybean	General Practice	Control			Area Type	C
Category	Management	Study Focus	CRP, Crop Rotations	Practice Overview	NC-CCN-CN-CS-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Normania clay loam (Aquic Haplustoll)								
Fertilizer	Annual N application rates for corn were determined from the NO3-N content in soil samples taken to a 1.2 m depth in April, previous crop (corn or soybean), and a yield goal of 8800 kg/ha. Urea was broadcast applied for corn each spring and incorporated within 24h by cultivation. Fertilizer P and K were not applied to the corn, soybean, or CRP plots because of very high soil tests for the nutrients.								
Comments	Subsurface tile drainage systems were used on 15 individual 13.7 x 15.3 m plots with separate drain outlets in this study. Four different treatments were used in this study. Two of these were applicable to this database - continuous corn (CC) and areas planted to the Conservation Reserve Program (CRP). Three replicates of each treatment were used. After a single disking, the CRP plots were planted to a mixture of alfalfa, smooth bromegrass, orchardgrass, and timothy, interseeded with a companion crop of oats. Annual N application rates for corn were determined from soil N tests, the previous crop and a yield goal of 8800 kg/ha. No N was applied to the CRP plots.								

Crop	1	Corn after soybean	Yield	2410	dry matter, kg/h
Crop	2	Corn after soybean	Yield	5710	dry matter, kg/h
Crop	3	Corn after soybean	Yield	6520	dry matter, kg/h
Crop	4	Corn after soybean	Yield	9040	dry matter, kg/h
Crop	5	Corn after soybean	Yield	7090	dry matter, kg/h
Crop	6	Corn after soybean	Yield	5590	dry matter, kg/h

Study ID	**201300535403**	**Study Area**	**Soybean after corn**	Area (ha)	0.02	Tillage	Field Cultivated	Cover Crop	None
Practice ID	3	Practice Name	Soybean after corn	General Practice		Control		Area Type	C
Category	Management	Study Focus	CRP, Crop Rotations	Practice Overview		NF-CCN-CT-CS-EN			
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Normania clay loam (Aquic Haplustoll)								
Fertilizer	-999999								
Comments	Subsurface tile drainage systems were used on 15 individual 13.7 x 15.3 m plots with separate drain outlets in this study. Four different treatments were used in this study. Two of these were applicable to this database - continuous corn (CC) and areas planted to the Conservation Reserve Program (CRP). Three replicates of each treatment were used. After a single disking, the CRP plots were planted to a mixture of alfalfa, smooth bromegrass, orchardgrass, and timothy, interseeded with a companion crop of oats. Annual N application rates for corn were determined from soil N tests, the previous crop and a yield goal of 8800 kg/ha. No N was applied to the CRP plots.								

Crop	1	Soybean after corn	Yield	1270	dry matter, kg/h
Crop	2	Soybean after corn	Yield	2690	dry matter, kg/h
Crop	3	Soybean after corn	Yield	2720	dry matter, kg/h
Crop	4	Soybean after corn	Yield	2540	dry matter, kg/h
Crop	5	Soybean after corn	Yield	2120	dry matter, kg/h
Crop	6	Soybean after corn	Yield	1990	dry matter, kg/h

Study ID	**201300535404**	**Study Area**	**Alfalfa**	Area (ha)	0.02	Tillage	Disked	Cover Crop	None
Practice ID	4	Practice Name	Alfalfa	General Practice	Control			Area Type	C
Category	Management	Study Focus	CRP, Crop Rotations	Practice Overview	NC-CCN-CT-GHP-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Normania clay loam (Aquic Haplustoll)								
Fertilizer	Potash was applied annually (1990-1993) to alfalfa after the first cutting at a rate of 112 kg K/ha.								
Comments	Subsurface tile drainage systems were used on 15 individual 13.7 x 15.3 m plots with separate drain outlets in this study. Four different treatments were used in this study. Two of these were applicable to this database - continuous corn (CC) and areas planted to the Conservation Reserve Program (CRP). Three replicates of each treatment were used. After a single disking, the CRP plots were planted to a mixture of alfalfa, smooth bromegrass, orchardgrass, and timothy, interseeded with a companion crop of oats. Annual N application rates for corn were determined from soil N tests, the previous crop and a yield goal of 8800 kg/ha. No N was applied to the CRP plots.								

Crop	1	Alfalfa	Yield	3090	dry matter, kg/h
Crop	2	Alfalfa	Yield	3780	dry matter, kg/h
Crop	3	Alfalfa	Yield	11610	dry matter, kg/h
Crop	4	Alfalfa	Yield	11900	dry matter, kg/h
Crop	5	Alfalfa	Yield	11480	dry matter, kg/h
Crop	6	Alfalfa	Yield	10270	dry matter, kg/h

Study ID	**201300535405**	**Study Area**	**CRP - Grass**	Area (ha)	0.02	Tillage	Disked	Cover Crop	None
Practice ID	5	Practice Name	CRP - Grass	General Practice	CRP			Area Type	T
Category	Management	Study Focus	CRP, Crop Rotations	Practice Overview	NF-CCN-CT-GHP-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Normania clay loam (Aquic Haplustoll)								
Fertilizer	No N applied.								
Comments	Subsurface tile drainage systems were used on 15 individual 13.7 x 15.3 m plots with separate drain outlets in this study. Four different treatments were used in this study. Two of these were applicable to this database - continuous corn (CC) and areas planted to the Conservation Reserve Program (CRP). Three replicates of each treatment were used. After a single disking, the CRP plots were planted to a mixture of alfalfa, smooth bromegrass, orchardgrass, and timothy, interseeded with a companion crop of oats. Annual N application rates for corn were determined from soil N tests, the previous crop and a yield goal of 8800 kg/ha. No N was applied to the CRP plots.								

Crop	1	Grass	Yield	2230	dry matter, kg/h
Crop	2	Grass	Yield	-999999	dry matter, kg/h

Crop	3	Grass	Yield	2960	dry matter, kg/h
Crop	4	Grass	Yield	3600	dry matter, kg/h
Crop	5	Grass	Yield	5250	dry matter, kg/h
Crop	6	Grass	Yield	5120	dry matter, kg/h

Study ID	**201300535406**	**Study Area**	**CRP - Alfalfa**	Area (ha)	0.02	Tillage	Disked	Cover Crop	None
Practice ID	6	Practice Name	CRP - Alfalfa	General Practice	CRP			Area Type	T
Category	Management	Study Focus	CRP, Crop Rotations	Practice Overview	NF-CCN-CT-GHP-EN				
Irrigation	NR	Irrig. Descrip.	N/A (rainfall)						
Soils	Normania clay loam (Aquic Haplustoll)								
Fertilizer	No N applied.								
Comments	Subsurface tile drainage systems were used on 15 individual 13.7 x 15.3 m plots with separate drain outlets in this study. Four different treatments were used in this study. Two of these were applicable to this database - continuous corn (CC) and areas planted to the Conservation Reserve Program (CRP). Three replicates of each treatment were used. After a single disking, the CRP plots were planted to a mixture of alfalfa, smooth bromegrass, orchardgrass, and timothy, interseeded with a companion crop of oats. Annual N application rates for corn were determined from soil N tests, the previous crop and a yield goal of 8800 kg/ha. No N was applied to the CRP plots.								

Crop	1	Alfalfa	Yield	390	dry matter, kg/h
Crop	2	Alfalfa	Yield	-999999	dry matter, kg/h
Crop	3	Alfalfa	Yield	2490	dry matter, kg/h
Crop	4	Alfalfa	Yield	390	dry matter, kg/h
Crop	5	Alfalfa	Yield	-999999	
Crop	6	Alfalfa	Yield	-999999	

Test Site ID	Test Site Name
2013005366	**Ritter, W. F., 1998**

Location	Georgetown	Sussex	DE	US
Study Citation	1998			
	Ritter, W. F., R. W. Scarborough and A. E. M. Chirnside.			
	Winter cover crops as a best management practice for reducing nitrogen leaching.			
	J. Contam. Hydrol. 34:1-15.			
NRCS LRR	Atlantic and Gulf Coast Lowland Forest and Crop Region			
NRCS MLRA	Atlantic Coast Flatwoods			
HUC_10	0208010901	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, and Replication			
	plot study: complete randomized block;			
Crops	Corn, rye			
Study Duration	3 years			

Summary

The role of rye as a winter cover crop to reduce nitrate leaching was investigated over a 3-year period for a loamy sand soil. A cover crop was planted after corn in the early fall and tilled in late March or early April the following spring. No-tillage and conventional tillage systems were compared on large plots with irrigated corn. A replicated randomized block design experiment was conducted on small plots to evaluate a rye cover crop under no-tillage and conventional tillage and with commercial fertilizer, poultry manure and composted poultry manure as nitrogen fertilizer sources. Nitrogen uptake by the cover crop along with nitrate concentrations in groundwater and the soil profile (0-150 cm) were measured on the larger plots. There was no significant difference in nitrate concentrations in the groundwater or soil profile with and without a cover crop in either no-tillage or conventional tillage. Annual nitrate-N leached to the water-table varied from 136.0 to 190.1 kg/ha in 1989 and from 82.4 to 116.2 kg/ha in 1991. Nitrate leaching rates were somewhat lower with a cover crop in 1989, but not in 1990. There was no statistically significant differences in corn grain yields between the cover crop and non-cover crop treatment, The planting date and adequate rainfall are very important in maximizing nitrogen uptake in the fall with a rye cover crop. In the Delmara Peninsula, the cover crop should probably be planted by October 1 to maximize nitrogen uptake rates in the fall. On loamy sand soils, rye winter cover crops cannot be counted on as a BMP for reducing nitrate leaching in the Mid-Atlantic states.

Study ID	**201300536601**	**Study Area**	**C-NT**	Area (ha)	0.25	Tillage	No Till	Cover Crop	Rye
Practice ID	1	Practice Name	Tillage, Cover Crop	General Practice	Cover Crop and Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop	Practice Overview	NM-CCY-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. No irrigation applied to the small plots in 1989 due to adequate rainfall. In 1990 and 1991, the small plots received 324 and 210 mm of irrigation, respectively.						
Soils	Evesboro loamy sand (Typic Quartzipssament)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments									

Crop 1 corn, rye Yield -999999 NA

Study ID	**201300536602**	**Study Area**	**NC-NT**	Area (ha)	0.25	Tillage	No Till	Cover Crop	None
Practice ID	2	Practice Name	Tillage, Cover Crop	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. No irrigation applied to the small plots in 1989 due to adequate rainfall. In 1990 and 1991, the small plots received 324 and 210 mm of irrigation, respectively.						
Soils	Evesboro loamy sand (Typic Quartzipssament)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments									

Crop 1 corn Yield -999999 NA

Study ID	**201300536603**	**Study Area**	**C-CT**	Area (ha)	0.25	Tillage	Conventional	Cover Crop	Rye
Practice ID	3	Practice Name	Cover Crop-Conventional Tillage	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. No irrigation applied to the small plots in 1989 due to adequate rainfall. In 1990 and 1991, the small plots received 324 and 210 mm of irrigation, respectively.						
Soils	Evesboro loamy sand (Typic Quartzipssament)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments									

Crop 1 corn, rye Yield -999999 NA

Study ID	**201300536604**	**Study Area**	**NC-CT**	Area (ha)	0.25	Tillage	Conventional	Cover Crop	None
Practice ID	4	Practice Name	No Cover Crop-Conventional Tillage	General Practice	Control			Area Type	C
Category	Management	Study Focus	Tillage, Cover Crop	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. No irrigation applied to the small plots in 1989 due to adequate rainfall. In 1990 and 1991, the small plots received 324 and 210 mm of irrigation, respectively.						
Soils	Evesboro loamy sand (Typic Quartzipssament)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments									

Crop	1	corn	Yield	-999999	NA

Study ID	**201300536605**	**Study Area**	**C-CT-P**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Rye
Practice ID	5	Practice Name	Cover Crop-Conventional Tillage-Poultry Manure	General Practice	Cover Crop and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCY-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments									

Crop	1	corn, rye	Yield	8517	kg/ha
Crop	2	corn, rye	Yield	7323	kg/ha
Crop	3	corn, rye	Yield	8106	kg/ha

Study ID	**201300536606**	**Study Area**	**C-NT-CP**	Area (ha)	0.01	Tillage	No Till	Cover Crop	Rye
Practice ID	6	Practice Name	Cover Crop-No-Till-Composted Poultry Manure	General Practice	Cover Crop, Conservation Tillage, and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments									

Crop	1	corn, rye	Yield	8210	kg/ha
Crop	2	corn, rye	Yield	7025	kg/ha
Crop	3	corn, rye	Yield	8467	kg/ha

Study ID	**201300536607**	**Study Area**	**C-NT-F**	Area (ha)	0.01	Tillage	No Till	Cover Crop	Rye
Practice ID	7	Practice Name	Cover Crop-No-Till-Commercial Fertilizer	General Practice	Cover Crop, Conservation Tillage, and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments									

Crop	1	corn, rye	Yield	8391 kg/ha
Crop	2	corn, rye	Yield	7291 kg/ha
Crop	3	corn, rye	Yield	8294 kg/ha

Study ID	**201300536608**	**Study Area**	**NC-NT-P**	Area (ha)	0.01	Tillage	No Till	Cover Crop	None
Practice ID	8	Practice Name	No Cover Crop-No-Till-Poultry Manure	General Practice	Conservation Tillage and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments									

Crop	1	corn	Yield	8568 kg/ha
Crop	2	corn	Yield	7009 kg/ha
Crop	3	corn	Yield	8216 kg/ha

Study ID	**201300536609**	**Study Area**	**NC-NT-CP**	Area (ha)	0.01	Tillage	No Till	Cover Crop	None
Practice ID	9	Practice Name	No Cover Crop-No-Till-Composted Poultry Manure	General Practice	Conservation Tillage and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments									

Crop	1	corn	Yield	8517 kg/ha
Crop	2	corn	Yield	6475 kg/ha
Crop	3	corn	Yield	7243 kg/ha

Study ID	**201300536610**	**Study Area**	**NC-NT-F**	Area (ha)	0.01	Tillage	No Till	Cover Crop	None
Practice ID	10	Practice Name	No Cover Crop-No-Till-Commercial Fertilizer	General Practice	Conservation Tillage and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCN-NT-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments									

Crop	1	corn	Yield	7764 kg/ha
Crop	2	corn	Yield	6617 kg/ha
Crop	3	corn	Yield	8060 kg/ha

Study ID	**201300536611**	**Study Area**	**C-CT-P**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Rye
Practice ID	11	Practice Name	Cover Crop-Conventional Tillage-Poultry Manure	General Practice	Cover Crop and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCY-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments									

Crop	1	corn, rye	Yield	7539 kg/ha
Crop	2	corn, rye	Yield	8059 kg/ha
Crop	3	corn, rye	Yield	8122 kg/ha

Study ID	**201300536612**	**Study Area**	**C-CT-CP**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Rye
Practice ID	12	Practice Name	Cover Crop-Conventional Tillage-Composted Poultry Manure	General Practice	Cover Crop and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments									

Crop	1	corn, rye	Yield	8109 kg/ha
Crop	2	corn, rye	Yield	7401 kg/ha
Crop	3	corn, rye	Yield	8091 kg/ha

Study ID	**201300536613**	**Study Area**	**C-CT-F**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	Rye
Practice ID	13	Practice Name	Cover Crop-Conventional Tillage-Commercial Fertilizer	General Practice	Cover Crop and Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments	This study investigated the role of winter cover crops in reducing nitrate leaching. At this study site, four large plots - 0.25 ha in size - were used to assess the nitrate leaching.								

Crop	1	corn, rye	Yield	8379	kg/ha
Crop	2	corn, rye	Yield	7605	kg/ha
Crop	3	corn, rye	Yield	8372	kg/ha

Study ID	**201300536614**	**Study Area**	**NC-CT-P**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	None
Practice ID	14	Practice Name	No Cover Crop-Conventional Tillage-Poultry Manure	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCN-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments	This study investigated the role of winter cover crops in reducing nitrate leaching. At this study site, four large plots - 0.25 ha in size - were used to assess the nitrate leaching.								

Crop	1	corn	Yield	8210	kg/ha
Crop	2	corn	Yield	8593	kg/ha
Crop	3	corn	Yield	8060	kg/ha

Study ID	**201300536615**	**Study Area**	**NC-CT-CP**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	None
Practice ID	15	Practice Name	No Cover Crop-Conventional Tillage-Composted Poultry Manure	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	Poultry manure from a complete cleanout of a broiler house and the composted poultry manure were applied shortly before planting at a rate of 280 kg/ha total nitrogen based upon a manure analysis on the small plots. Lime and phosphorus and potassium fertilizer were applied according to soil tests.								
Comments	This study investigated the role of winter cover crops in reducing nitrate leaching. At this study site, four large plots - 0.25 ha in size - were used to assess the nitrate leaching.								

Crop	1	corn	Yield	8963	kg/ha
Crop	2	corn	Yield	7558	kg/ha
Crop	3	corn	Yield	7871	kg/ha

Study ID	**201300536616**	**Study Area**	**NC-CT-F**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	None
Practice ID	16	Practice Name	No Cover Crop-Conventional Tillage-Commercial Fertilizer	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	Yes	Irrig. Descrip.	Solid-set sprinkler irrigation at 9.1 x 9.1 spacing. The large plots received 133, 342 and 269 mm of irrigation water in 1989, 1990 and 1991, respectively.						
Soils	Matawan loamy sand soil (fine-loamy, siliceous, mesic, aquic hapludults)								
Fertilizer	30% Urea-ammonia-nitrate (UAN) liquid nitrogen fertilizer was used for the commercial fertilizer. A total of 56 kg/ha of nitrogen was applied at planting, 67 kg/ha was side-dressed when the corn was 15 cm high and 101 kg/ha was side-dressed when the corn was 60 cm high.								
Comments	This study investigated the role of winter cover crops in reducing nitrate leaching. At this study site, four large plots - 0.25 ha in size - were used to assess the nitrate leaching.								

Crop	1	corn	Yield	8957	kg/ha
Crop	2	corn	Yield	7777	kg/ha
Crop	3	corn	Yield	8201	kg/ha

Test Site ID	Test Site Name
2013005380	Schreiber, J. D., 1998

Location	Como	Panola	MS	US
Study Citation	1998			
	Schreiber, J. D. and R. F. Cullum.			
	Tillage effects on surface and groundwater quality in loessial upland soybean watersheds.			
	Trans. ASAE 41:607-614.			
NRCS LRR	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region			
NRCS MLRA	Carolina and Georgia Sand Hills			
HUC_10	0803020406	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	paired watershed study			
Crops	Soybeans			
Study Duration	4 years			

Summary

The objective of this research was to evaluate the water quality of perched groundwater (0.15 to 3.04 m) and surface runoff from a 2.13 ha no-till and a 2.10 ha conventional-till soybean watershed for plant nutrients during the 1990-1993 water years. Mean nitrate-N concentrations for all groundwater depths and sites of the no-till and conventional-till watersheds were 4.81 and 5.98 mg/L, respectively. Shallow groundwater NO3-N concentrations for some storms exceeded U.S. Drinking Water Standards. However, in a forested riparian zone, only 61 m down slope from the conventional-till watersheds, the mean NO3-N concentration in groundwater was only 0.29 mg/L. Higher nutrient concentrations on surface runoff from the no-till watershed reflect the lack of sediment to sorb soluble PO4-P as well as the leaching of crop and weed residues. Despite greater runoff from the conventional-till watershed, soluble nutrient losses were generally similar from the no-till watershed due to the higher nutrient concentrations. Nutrient concentrations in surface runoff from both watersheds peaked a few days after a broadcast application of 0-20-20 and decreased during subsequent storms. Alternative methods of fertilizer application are needed to reduce nutrient concentrations in surface runoff.

Study ID	**201300538001**	**Study Area**	**Watershed 1**	Area (ha)	2.13	Tillage	No Till	Cover Crop	None
Practice ID	614	Practice Name	No-till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCN-NT-SB-EN				
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Loring-Grenada series								
Fertilizer	In the 1992 and 1993 cropping year, 0-26-26 fertilizer was broadcast applied to both watersheds at an application rate of 174 kg/ha.								
Comments	Paired watersheds were both cropped to minimum-till soybeans for two years prior to the study. This study evaluates the impact of tillage on both surface runoff and shallow groundwater. Watershed1 was planted in no-till soybeans, while Watershed2 was planted in conventional-till soybeans. Both watersheds were monitored at their outlets, as well as with shallow groundwater wells (<3.04 m). Data were collected by Water Year, and are reported as annual average concentrations and total unit area loads.								

Crop	1	corn	Yield	-999999	NA
Crop	2	soybean	Yield	-999999	NA
Crop	3	soybean	Yield	-999999	NA

Crop	4	soybean		Yield	-999999	NA			
Study ID	**201300538002**	**Study Area**	**Watershed 2**	Area (ha)	2.10	Tillage	Conventional	Cover Crop	None
Practice ID	613	Practice Name	Conventional	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CN-SB-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Loring-Grenada series								
Fertilizer	In the 1992 and 1993 cropping year, 0-26-26 fertilizer was broadcast applied to both watersheds at an application rate of 174 kg/ha.								
Comments	Paired watersheds were both cropped to minimum-till soybeans for two years prior to the study. This study evaluates the impact of tillage on both surface runoff and shallow groundwater. Watershed1 was planted in no-till soybeans, while Watershed2 was planted in conventional-till soybeans. Both watersheds were monitored at their outlets, as well as with shallow groundwater wells (<3.04 m). Data were collected by Water Year, and are reported as annual average concentrations and total unit area loads.								
Crop	1	soybean		Yield	-999999	NA			
Crop	2	soybean		Yield	-999999	NA			
Crop	3	soybean		Yield	-999999	NA			
Crop	4	soybean		Yield	-999999	NA			

Test Site ID	Test Site Name
2016002013	**Shipitalo et al., 1997**

Location		Coshocton	OH	US
Study Citation	1997			
	Shipitalo, M. J., Edwards, W. M., Owens, L. B.			
	Herbicide Losses in Runoff from Conservation-Tilled Watersheds in a Corn-Soybean Rotation			
	Soil Science Society of America Journal			
NRCS LRR	East and Central Farming and Forest Region			
NRCS MLRA	Western Allegheny Plateau			
HUC_10	0504000119	Test Site Scale	Field	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	Four watershed, two each in chisel plow and no-till, were monitored for surface runoff herbicide concentrations. Tillage treatment configuration was not randomized and assigned based on long term hydrologic records.			
Crops	Corn-Soybean			
Study Duration	4 years			

Summary

Runoff from two chiseled and two no-till watersheds was monitored for 4 yr to determine the effect of this cropping sequence on losses of four commonly used herbicides: alachlor, atrazine, linuron, and metribuzin. The load of linuron and atrazine were compared to determine if substitution of linuron for atrazine would decrease herbicide loss in runoff. As a percentage of applied chemical, average losses were small with atrazine (0.31%) > linuron (0.20%) > metribuzin (0.14%) > alachlor (0.05%). Atrazine concentrations consistently exceeded the lifetime Health Advisory Level-Maximum Contaminant Level (HAL-MCL) of 3 µg L−1 in the first few runoff events after application. Average linuron loss was significantly less ($P \leq 0.05$) than that of atrazine and linuron was rarely detected in runoff following corn harvest or during soybean years.

Study ID	**201600201301**	**Study Area**	**Chisel Plow 1 (WS 109)**	Area (ha)	0.68	Tillage	Chisel Plow	Cover Crop	Ryegrass
Practice ID	1	Practice Name	Chisel Plow 1 (WS 109)	General Practice	Conservation Tillage			Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Rayne silt loam (fine-loamy, mixed, mesic Typic Haludult)								
Fertilizer	Not provided								
Comments	Due to differences in watershed characteristics (soils and rainfall) and non-randomized design no-till and chisel till treatments were not compared.								

Crop	1	Soybean	Yield
Crop	2	Corn	Yield
Crop	3	Soybean	Yield
Crop	4	Corn	Yield

Study ID	**201600201302**	**Study Area**	**Chisel Plow 2 (WS 123)**	Area (ha)	0.55	Tillage	Chisel Plow	Cover Crop	Ryegrass
Practice ID	2	Practice Name	Chisel Plow 2 (WS 123)	General Practice	Conservation Tillage			Area Type	C
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Keene silt loam (fine-silty, mixed, mesic Aquic Hapludalf)								
Fertilizer	Not provided								
Comments	Due to differences in watershed characteristics (soils and rainfall) and non-randomized design no-till and chisel till treatments were not compared.								

Crop	5	Corn	Yield
Crop	6	Soybean	Yield
Crop	7	Corn	Yield
Crop	8	Soybean	Yield

Study ID	**201600201303**	**Study Area**	**No-Till 1 (WS 113)**	Area (ha)	0.59	Tillage	No-Till	Cover Crop	Ryegrass
Practice ID	3	Practice Name	No-Till 1 (WS 113)	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Coshocton silt loam (fine-loamy, mixed, mesic, Aquultic Haludalf)								
Fertilizer	Not provided								
Comments	Due to differences in watershed characteristics (soils and rainfall) and non-randomized design no-till and chisel till treatments were not compared.								

Crop	9	Soybean	Yield
Crop	10	Corn	Yield
Crop	11	Soybean	Yield
Crop	12	Corn	Yield

Study ID	**201600201304**	**Study Area**	**No-Till 2 (WS 118)**	Area (ha)	0.79	Tillage	No-Till	Cover Crop	Ryegrass
Practice ID	4	Practice Name	No-Till 2 (WS 118)	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview	NC-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Coshocton silt loam (fine-loamy, mixed, mesic, Aquultic Haludalf)								
Fertilizer	Not provided								
Comments	Due to differences in watershed characteristics (soils and rainfall) and non-randomized design no-till and chisel till treatments were not compared.								

Crop	13	Corn	Yield
Crop	14	Soybean	Yield
Crop	15	Corn	Yield
Crop	16	Soybean	Yield

Test Site ID	Test Site Name
2013002002	**Shipitalo, M. J., 2013**

Location	Coshocton	Coshocton	OH	US
Study Citation	2013			
	M. J. Shipitalo, L. B. Owens, J. V. Bonta, and W. M. Edwards			
	Effect of No-Till and Extended Rotation on Nutrient Losses in Surface Runoff			
	Soil Sci. Soc. Am. J. doi:10.2136/sssaj2013.01.0045			
NRCS LRR	East and Central Farming and Forest Region			
NRCS MLRA	Western Allegheny Plateau			
HUC_10	0504000119	Test Site Scale	Field	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	2 no-till sites, 2 chisel till sites			
Crops	Corn, Soybeans, Wheat			
Study Duration	16 years			

Summary

Nutrient and sediment loss were compared from two no-till and two chisel-till small (0.45–0.79 ha) watersheds managed in a 2-yr corn/soybean cover crop rotation for 16 crop years. The effect of replacing some of the mineral N with manure and red clover was investigated by monitoring runoff from three watersheds in a 3-yr corn/soybean/wheat–red clover extended rotation. The reduced-input watersheds were disked in corn and soybean years.

Study ID	**201300200201**	**Study Area**	**WS 109**	Area (ha)	0.68	Tillage	Conventional	Cover Crop	Rye - Secale cerale L.
Practice ID	1	Practice Name	Chisel	General Practice	Control			Area Type	C
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCY-CN-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Rayne, Fine-loamy, mixed, active, mesic Typic Hapludults								
Fertilizer	In corn years, ammonium nitrate was broadcast applied shortly after planting at a rate bae don Ohio State University Extension recommendations (Vitosh et al., 1995) and moderate yield goals (Table 2). After soybean harvest, cereal rye was planted in these watersheds as a winter cover crop.								
Comments									

Crop	1	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	8	Soybean, for grain	Yield	2.4	Mg/ha
Crop	15	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	22	Soybean, for grain	Yield	2.4	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Crop	29	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	36	Soybean, for grain	Yield	2.4	Mg/ha
Crop	43	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	50	Soybean, for grain	Yield	2.4	Mg/ha
Crop	57	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	64	Soybean, for grain	Yield	2.4	Mg/ha
Crop	71	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	78	Soybean, for grain	Yield	2.4	Mg/ha
Crop	85	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	92	Soybean, for grain	Yield	2.4	Mg/ha
Crop	99	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	106	Soybean, for grain	Yield	2.4	Mg/ha

Study ID	**201300200202**	**Study Area**	**WS 123**	Area (ha)	0.55	Tillage	Conventional	Cover Crop	Rye - Secale cerale L.
Practice ID	2	Practice Name	Chisel	General Practice	Control			Area Type	C
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCY-CN-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Keene, Fine-silty, mixed, superactive, mesic Aquic Hapludalfs								
Fertilizer	In corn years, ammonium nitrate was broadcast applied shortly after planting at a rate bae don Ohio State University Extension recommendations (Vitosh et al., 1995) and moderate yield goals (Table 2). After soybean harvest, cereal rye was planted in these watersheds as a winter cover crop.								
Comments									

Crop	2	Soybean, for grain	Yield	2.4	Mg/ha
Crop	9	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	16	Soybean, for grain	Yield	2.4	Mg/ha
Crop	23	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	30	Soybean, for grain	Yield	2.4	Mg/ha
Crop	37	Corn-Field, for grain	Yield	8.6	Mg/ha

Crop	44	Soybean, for grain	Yield	2.4	Mg/ha
Crop	51	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	58	Soybean, for grain	Yield	2.4	Mg/ha
Crop	65	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	72	Soybean, for grain	Yield	2.4	Mg/ha
Crop	79	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	86	Soybean, for grain	Yield	2.4	Mg/ha
Crop	93	Corn-Field, for grain	Yield	8.6	Mg/ha
Crop	100	Soybean, for grain	Yield	2.4	Mg/ha
Crop	107	Corn-Field, for grain	Yield	8.6	Mg/ha

Study ID	**201300200203**	**Study Area**	**WS 113**	Area (ha)	0.59	Tillage	No Till	Cover Crop	Rye - Secale cerale L.
Practice ID	3	Practice Name	No-till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Coshocton, Fine-loamy, mixed, active, mesic Aquultic Hapludalfs								
Fertilizer	In corn years, ammonium nitrate was broadcast applied shortly after planting at a rate bae don Ohio State University Extension recommendations (Vitosh et al., 1995) and moderate yield goals (Table 2). After soybean harvest, cereal rye was planted in these watersheds as a winter cover crop.								
Comments									

Crop	3	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	10	Soybean, for grain	Yield	2.2	Mg/ha
Crop	17	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	24	Soybean, for grain	Yield	2.2	Mg/ha
Crop	31	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	38	Soybean, for grain	Yield	2.2	Mg/ha
Crop	45	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	52	Soybean, for grain	Yield	2.2	Mg/ha

Crop	59	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	66	Soybean, for grain	Yield	2.2	Mg/ha
Crop	73	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	80	Soybean, for grain	Yield	2.2	Mg/ha
Crop	87	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	94	Soybean, for grain	Yield	2.2	Mg/ha
Crop	101	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	108	Soybean, for grain	Yield	2.2	Mg/ha

Study ID	**201300200204**	**Study Area**	**WS 118**	Area (ha)	0.79	Tillage	No Till	Cover Crop	Rye - Secale cerale L.
Practice ID	4	Practice Name	No-till	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NC-CCY-NT-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Coshocton, Fine-loamy, mixed, active, mesic Aquultic Hapludalfs								
Fertilizer	In corn years, ammonium nitrate was broadcast applied shortly after planting at a rate bae don Ohio State University Extension recommendations (Vitosh et al., 1995) and moderate yield goals (Table 2). After soybean harvest, cereal rye was planted in these watersheds as a winter cover crop.								
Comments									

Crop	4	Soybean, for grain	Yield	2.2	Mg/ha
Crop	11	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	18	Soybean, for grain	Yield	2.2	Mg/ha
Crop	25	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	32	Soybean, for grain	Yield	2.2	Mg/ha
Crop	39	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	46	Soybean, for grain	Yield	2.2	Mg/ha
Crop	53	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	60	Soybean, for grain	Yield	2.2	Mg/ha
Crop	67	Corn-Field, for grain	Yield	8.1	Mg/ha

Crop	74	Soybean, for grain	Yield	2.2	Mg/ha
Crop	81	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	88	Soybean, for grain	Yield	2.2	Mg/ha
Crop	95	Corn-Field, for grain	Yield	8.1	Mg/ha
Crop	102	Soybean, for grain	Yield	2.2	Mg/ha
Crop	109	Corn-Field, for grain	Yield	8.1	Mg/ha

Study ID	**201300200205**	**Study Area**	**WS 111**	Area (ha)	0.45	Tillage	Disked	Cover Crop	Red Clover - Trifolium pratense L.
Practice ID	5	Practice Name	Disked Reduced Input	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Keene, Fine-silty, mixed, superactive, mesic Aquic Hapludalfs								
Fertilizer	Beef cattle manure spread and disked in along with the standing red clover to supply some of the nutrient requirements for the corn crop. Additionally, a mixed starter fertilizer was applied at corn planting in crop years 1990 to 1995. During the corn and soybean crop years, the watersheds were usually cultivated twice between the rows for weed control and a side-dress application of ammonium nitrate was applied to the corn.								
Comments									

Crop	5	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	12	Soybean, for grain	Yield	1.9	Mg/ha
Crop	19	Wheat, for grain	Yield	2.1	Mg/ha
Crop	26	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	33	Soybean, for grain	Yield	1.9	Mg/ha
Crop	40	Wheat, for grain	Yield	2.1	Mg/ha
Crop	47	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	54	Soybean, for grain	Yield	1.9	Mg/ha
Crop	61	Wheat, for grain	Yield	2.1	Mg/ha
Crop	68	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	75	Soybean, for grain	Yield	1.9	Mg/ha

Crop	82	Wheat, for grain	Yield	2.1	Mg/ha
Crop	89	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	96	Soybean, for grain	Yield	1.9	Mg/ha
Crop	103	Wheat, for grain	Yield	2.1	Mg/ha
Crop	110	Corn-Field, for grain	Yield	8.2	Mg/ha

Study ID	**201300200206**	**Study Area**	**WS 115**	Area (ha)	0.65	Tillage	Disked	Cover Crop	Red Clover - Trifolium pratense L.
Practice ID	6	Practice Name	Disked Reduced Input	General Practice	Conservation Tillage	Area Type	T		
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Coshocton, Fine-loamy, mixed, active, mesic Aquultic Hapludalfs								
Fertilizer	Beef cattle manure spread and disked in along with the standing red clover to supply some of the nutrient requirements for the corn crop. Additionally, a mixed starter fertilizer was applied at corn planting in crop years 1990 to 1995. During the corn and soybean crop years, the watersheds were usually cultivated twice between the rows for weed control and a side-dress application of ammonium nitrate was applied to the corn.								
Comments									

Crop	6	Soybean, for grain	Yield	1.9	Mg/ha
Crop	13	Wheat, for grain	Yield	2.1	Mg/ha
Crop	20	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	27	Soybean, for grain	Yield	1.9	Mg/ha
Crop	34	Wheat, for grain	Yield	2.1	Mg/ha
Crop	41	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	48	Soybean, for grain	Yield	1.9	Mg/ha
Crop	55	Wheat, for grain	Yield	2.1	Mg/ha
Crop	62	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	69	Soybean, for grain	Yield	-999999	Mg/ha
Crop	76	Wheat, for grain	Yield	2.1	Mg/ha
Crop	83	Corn-Field, for grain	Yield	8.2	Mg/ha

Crop	90	Soybean, for grain	Yield	1.9	Mg/ha
Crop	97	Wheat, for grain	Yield	2.1	Mg/ha
Crop	104	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	111	Soybean, for grain	Yield	1.9	Mg/ha

Study ID	**201300200207**	**Study Area**	**WS 127**	Area (ha)	0.67	Tillage	Disked	Cover Crop	Red Clover - Trifolium pratense L.
Practice ID	7	Practice Name	Disked Reduced Input	General Practice	Conservation Tillage			Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview	NM-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Coshocton, Fine-loamy, mixed, active, mesic Aquultic Hapludalfs								
Fertilizer	Beef cattle manure spread and disked in along with the standing red clover to supply some of the nutrient requirements for the corn crop. Additionally, a mixed starter fertilizer was applied at corn planting in crop years 1990 to 1995. During the corn and soybean crop years, the watersheds were usually cultivated twice between the rows for weed control and a side-dress application of ammonium nitrate was applied to the corn.								
Comments									

Crop	7	Wheat, for grain	Yield	2.1	Mg/ha
Crop	14	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	21	Soybean, for grain	Yield	-999999	Mg/ha
Crop	28	Wheat, for grain	Yield	2.1	Mg/ha
Crop	35	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	42	Soybean, for grain	Yield	1.9	Mg/ha
Crop	49	Wheat, for grain	Yield	2.1	Mg/ha
Crop	56	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	63	Soybean, for grain	Yield	1.9	Mg/ha
Crop	70	Wheat, for grain	Yield	2.1	Mg/ha
Crop	77	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	84	Soybean, for grain	Yield	1.9	Mg/ha
Crop	91	Wheat, for grain	Yield	2.1	Mg/ha

Crop	98	Corn-Field, for grain	Yield	8.2	Mg/ha
Crop	105	Soybean, for grain	Yield	1.9	Mg/ha
Crop	112	Wheat, for grain	Yield	2.1	Mg/ha

Study ID	**201300200208**	**Study Area**	**WS 109/123**	Area (ha)	1.23	Tillage	Conventional	Cover Crop	
Practice ID	8	Practice Name	Chisel	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview		NC-CCN-CN-CS-EN			
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	109: Rayne, Fine-loamy, mixed, active, mesic Typic Hapludults. 123: Keene, Fine-silty, mixed, superactive, mesic Aquic Hapludalfs								
Fertilizer									
Comments	(practice entered to facilitate data analysis; combines results from WS109 & WS123]								

Crop Yield

Study ID	**201300200209**	**Study Area**	**WS 113/118**	Area (ha)	1.38	Tillage	No Till	Cover Crop	
Practice ID	9	Practice Name	No-till	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview		NC-CCN-NT-CS-EN			
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	Coshocton, Fine-loamy, mixed, active, mesic Aquultic Hapludalfs								
Fertilizer									
Comments	Combined watersheds to facilitate data analysis.								

Crop Yield

Study ID	**201300200210**	**Study Area**	**WS 111/115/127**	Area (ha)	1.77	Tillage	Disked	Cover Crop	
Practice ID	10	Practice Name	Disked Reduced Input	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage, Cover Crop, Fertilizer	Practice Overview		NM-CCY-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	Dryland (none)						
Soils	115, 127: Coshocton, Fine-loamy, mixed, active, mesic Aquultic Hapludalfs. 111: Keene, Fine-silty, mixed, superactive, mesic Aquic Hapludalfs								
Fertilizer									
Comments	(combined watershed to facilitate data analysis)								

Crop Yield

Test Site ID	Test Site Name
2013005414	**Snyder, N. J., 1998**

Location		Westmoreland	VA	US

Study Citation	1998
	Snyder, N. J., S. Mostaghimi, D. F. Berry, R. B. Reneau, S. Hong, P. W. McClellan and E. P. Smith.
	Impact of riparian forest buffers on agricultural nonpoint source pollution.
	J. Am. Water Resour. Assoc. 34:385-395.
NRCS LRR	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region
NRCS MLRA	Southern Coastal Plain
HUC_10	0207001108
Test Site Scale	Field
Experimental Design Type/ Description	Inflow-Outflow
	Groundwater samples were collected approximately biweekly from 20 sampling locations at various positions up and down slope of the buffer. The upslope measurements were averaged from the two wells in the agricultural field, and the downslope measurements ere averaged from the two wells just above the stream in the riparian buffer.
Crops	Corn, Soybeans
Study Duration	20 months

Summary

A field monitoring study of a riparian buffer zone was conducted to determine the impact of the riparian ecosystem on reducing the concentration of agricultural nonpoint source pollutants. Groundwater samples were collected from 20 sampling locations between May 1993 and December 1994, and analyzed for NO3-N, PO4, and NH4-N. The study showed that the buffer was effective in reducing nitrate concentrations from upland fields. Instream nitrate concentrations were 48 percent less than those measured in the agricultural field. Reductions in concentrations in sampling locations at the wetland edge ranged from 16 to 70 percent. The mean nitrate concentrations in forested hill slope were 45 percent less than concentrations in a well located in an upland agricultural field. Meanwhile, the concentrations of phosphate and ammonia did not follow any specific spatial trend and were generally higher during the summer season for most sampling locations.

Study ID	**201300541401**	**Study Area**	**Nomini**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	Yes, unnamed
Practice ID	419	Practice Name	Riparian buffer	General Practice		Riparian Buffer		Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview		NC-CCY-CN-CS-EB			
Irrigation	NR	Irrig. Descrip.	natural rainfall						

Soils	Soils vary with their topographic location. Cultivated upland areas are Suffolk series (coarse-loamy, siliceous, thermic Typic Hapludults) soils. These soils are deep and well drained, forming in coarse to medium textured fluvial sediments. They are susce
Fertilizer	February 25, 1992 Liquid 89.7-0-0 (N-P-K) kg/ha/yr. March 2, 1993 Granular/Liquid 131.2-41.5-67.2 (N-P-K) kg/ha/yr.
Comments	The riparian buffer was on the order of 100 m in width, half with a slope of 0-6%, the other half with slopes of 10-20%. Groundwater wells were located at various positions up and down slope.

Crop	1	corn, soybean	Yield	-999999

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2013007068	**Steinheimer et al. 1998**

Location	Treynor	Pottawattamie	IA	US

Study Citation	1998
	Steinheimer, T.R., K.D. Scoggin, and L.A. Kramer.
	Agricultural Chemical Movement through a Field-Size Watershed in Iowa: Subsurface Hydrology and Distribution of Nitrate in Groundwater
	Environ. Sci. Technol. 32(8): 1039-1047
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Till Plains
HUC_10	1024000206
Test Site Scale	Field
Experimental Design Type/ Description	Long-term trend (single site)
	Long-term trend study of a 40-ha field to determine the impact of corn production in ridge-tilled soils on the nitrate-nitrogen loading in groundwater.
Crops	Corn
Study Duration	23 years

Summary

An agricultural watershed in the Iowa Loess Hills with a 23-year history of annual corn production with average N fertilization is studied. Headcut seepage is transported through a natural riparian zone and observed as weir baseflow; surface runoff is measured separately. The concentration of nitrate carried from the field in basin drainage steadily increased from <1 mg/L in 1969 to >20 mg/L in 1991. The rate of cumulative increase in the amount of applied N is greater than the rate of removal by the crop. Over the 23-year record, 23% of the mean annual application of N remains stored and available for leaching or chemical conversion by soil microbes. Nitrate removal during early spring snowmelt surface runoff shows a diurnal pattern that corresponds to the daily freezing and thawing of the surface soil in early March. Contribution to the load of nitrate deposited on the soil surface by rainfall is very small in comparison to the amount applied by fertilizer application. Measurable changes in water quality within various hydrogeologic compartments are seldom observed in just a few years of monitoring. The results emphasize the importance of long-term data sets incorporating temporal variability when evaluating the impact of agricultural practices on surface water.

Study ID	**201300706801**	**Study Area**	**Watershed 3**	Area (ha)	40.00	Tillage	Ridge Till	Cover Crop	None
Practice ID	1	Practice Name	Ridge-tillage	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage	Practice Overview		NC-CCN-CT-CO-EN			
Irrigation	No	Irrig. Descrip.							

Soils	Loess-derived soil, relatively porous, low bulk density, easily eroded
Fertilizer	Nitrogen fertilization began in 1968 and has averaged 168 kg/ha as an annual application in the spring (1968-1994). Report provides the 27-year record of annual amount and chemical form of N fertilizer applied.
Comments	Imported from MANAGE 2013. This study is more focused on long-term trends than "ridge till", but it is the key conservation practice at the site. Ridge-tillage: 6-10 in. ridges of soil are built up over the seedbed in 38-in. width corn rows. This creates microterraces along the landscape contour, which increase infiltration and decrease erosion. More than half of the plant residue on the field each year.

Crop	1	Continuous Corn	Yield	-999999 NA

Test Site ID	Test Site Name
2016001002	**Strock et al. 2004**

Location		Redwood	MN	US
Study Citation	2004			
	Strock, J.S., Porter, P.M., Russelle, M.P.			
	Cover Cropping to Reduce Nitrate Loss through Subsurface Drainage in the Northern U.S. Corn Belt			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0702000804	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	Randomized Complete Block Design with 4 Replications			
Crops	soybean-corn, corn-soybean, soybean-corn-rye, corn-rye-soybean			
Study Duration	3 years			

Summary

The authors' objective was to determine whether an autumn-seeded winter rye (Secale cereale L.) cover crop following corn (Zea mays L.) would reduce $NO3^-$–N losses through subsurface tile drainage in a corn–soybean [Glycine max (L.) Merr.] cropping system in the northern Corn Belt (USA). Cover cropping did not affect subsequent soybean yield, but reduced drainage discharge, flow-weighted mean nitrate concentration, and $NO3^-$–N loss relative to winter fallow, although the magnitude of the effect varied considerably with annual precipitation. Three-year average drainage discharge was lower with a winter rye cover crop than without ($p = 0.06$). Over three years, subsurface tile-drainage discharge was reduced 11% and $NO3^-$ –N loss was reduced 13% for a corn–soybean cropping system with a rye cover crop following corn than with no rye cover crop.

Study ID	**201600100201**	**Study Area**	**Control - Soy**	Area (ha)	0.02	Tillage	disk cultivation	Cover Crop	
Practice ID	1	Practice Name	Control - Soy	General Practice		Control		Area Type	C
Category	Management	Study Focus	Cover Crop	Practice Overview		NM-CCN-CT-CS-EN			
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania loam, 1 to 3 percent slopes								
Fertilizer	Urea (134 kg N /ha) was broadcast-appliedfor corn each spring and incorporated within 24 h by disk cultivation. Fertilizer P and K rates for corn were determined from soil samples collected in autumn.								
Comments									

Crop	1	Soybean	Yield	2.7 Mg/ha
Crop	2	Corn	Yield	9.8 Mg/ha
Crop	3	Soybean	Yield	3.1 Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201600100202**	**Study Area**	**Cover Crop - Soy**	Area (ha)	0.02	Tillage	disk cultivation; no-till drill for rye	Cover Crop	Ryegrass
Practice ID	2	Practice Name	Cover Crop - Soy	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Cover Crop	Practice Overview	NM-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania loam, 1 to 3 percent slopes								
Fertilizer	Urea (134 kg N /ha) was broadcast-appliedfor corn each spring and incorporated within 24 h by disk cultivation. Fertilizer P and K rates for corn were determined from soil samples collected in autumn.								
Comments									

Crop	4	Soybean	Yield	2.7	Mg/ha
Crop	5	Corn	Yield	9.7	Mg/ha
Crop	6	Soybean	Yield	3.1	Mg/ha

Study ID	**201600100203**	**Study Area**	**Control - Corn**	Area (ha)	0.02	Tillage	disk cultivation	Cover Crop	
Practice ID	3	Practice Name	Control - Corn	General Practice	Control			Area Type	C
Category	Management	Study Focus	Cover Crop	Practice Overview	NM-CCN-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania loam, 1 to 3 percent slopes								
Fertilizer	Urea (134 kg N /ha) was broadcast-appliedfor corn each spring and incorporated within 24 h by disk cultivation. Fertilizer P and K rates for corn were determined from soil samples collected in autumn.								
Comments									

Crop	7	Corn	Yield	10	Mg/ha
Crop	8	Soybean	Yield	3.5	Mg/ha
Crop	9	Corn	Yield	7.4	Mg/ha

Study ID	**201600100204**	**Study Area**	**Cover Crop - Corn**	Area (ha)	0.02	Tillage	disk cultivation; no-till drill for rye	Cover Crop	Ryegrass
Practice ID	4	Practice Name	Cover Crop - Corn	General Practice	Cover Crop			Area Type	T
Category	Management	Study Focus	Cover Crop	Practice Overview	NM-CCY-CT-CS-EN				
Irrigation	No	Irrig. Descrip.	No irrigation.						
Soils	Normania loam, 1 to 3 percent slopes								
Fertilizer	Urea (134 kg N /ha) was broadcast-appliedfor corn each spring and incorporated within 24 h by disk cultivation. Fertilizer P and K rates for corn were determined from soil samples collected in autumn.								
Comments									

Crop	10	Corn	Yield	9.6	Mg/ha
Crop	11	Soybean	Yield	3.4	Mg/ha
Crop	12	Corn	Yield	7.6	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2016002008	**Tan et al., 2002**

Location		Ontario	ZZ	CA
Study Citation	2002			
	Tan, C. S., Drury, C. F., Reynolds, W. D., Groenevelt, P. H., Dadfar, H.			
	Water and nitrate loss through tiles under a clay loam soil in Ontario after 42 years of consistent fertilization and crop rotation			
	Agriculture, Ecosystems and Environment			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
Crops	Continuous corn, continuous bluegrass sod, and corn-oat-alfalfa-alfalfa			
Study Duration	3 years			

Summary

Automated monitoring for continuous corn, continuous bluegrass sod, and a corn–oat–alfalfa–alfalfa rotation treatments were monitored for tile drainage nitrate levels in southwestern Ontario. Fertilized and not-fertilized phases were included with each of the six crops to give a total of 12 treatments. Measurements included precipitation, tile discharge, corn yield and nitrate concentration and total nitrate loss in tile drainage water. The fertilized CC, fertilized rotation corn. and second year fertilized alfalfa treatments produced 3-year flow weighted mean (FWM) nitrate concentrations in tile drainage water of 15.2, 18.0 and 16.2 mg N l−1, respectively, all of which exceed the Canadian and European drinking water guideline values of 10 and 11.3 mg N l−1, respectively. The 3-year cumulative nitrate losses were high at 82.0 kg N ha−1 for fertilized CC, 99.9 kg N ha−1 for fertilized rotation corn and 69.8 kg N ha−1 for second year fertilized alfalfa.

Study ID	**201600200801**	**Study Area**	**Continuous Corn (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	1	Practice Name	Continuous Corn (Fertilized)	General Practice		Crop Rotation, Fertilizer		Area Type	C
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview		NM-CCN-CN-CO-EN			
Irrigation	No	Irrig. Descrip.							

Soils: Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%

Fertilizer: The fertilized treatments of all four crops receive chemical fertilizer applications of 16.8 kgNha−1, 67.2 kg P2O5 ha−1 and 33.6 kgK2Oha−1 in the early spring (April–May). Corn in the fertilized treatments receives an additional 112 kgNha−1 of ammonium nitrate applied in bands 15 cm on either side of the row (2–5 cm depth) when the corn is at the 6-leaf stage (usually in early–mid June).

Comments

Crop	1	Corn	Yield	3.22	t/acre
Crop	2	Corn	Yield	0.57	t/acre
Crop	3	Corn	Yield	1.96	t/acre

Study ID	**201600200802**	**Study Area**	**Continuous Bluegrass Sod (Fertilized)**	Area (ha)	0.09	Tillage	No-Till	Cover Crop	
Practice ID	2	Practice Name	Continuous Bluegrass Sod (Fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NM-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	The fertilized treatments of all four crops receive chemical fertilizer applications of 16.8 kgNha−1, 67.2 kg P2O5 ha−1 and 33.6 kgK2Oha−1 in the early spring (April–May). Corn in the fertilized treatments receives an additional 112 kgNha−1 of ammonium nitrate applied in bands 15 cm on either side of the row (2–5 cm depth) when the corn is at the 6-leaf stage (usually in early–mid June).								
Comments									

Crop	4	Bluegrass Sod	Yield	
Crop	5	Bluegrass Sod	Yield	
Crop	6	Bluegrass Sod	Yield	

Study ID	**201600200803**	**Study Area**	**Four Crop Rotation - Corn Year (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	3	Practice Name	Four Crop Rotation - Corn Year (Fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	The fertilized treatments of all four crops receive chemical fertilizer applications of 16.8 kgNha−1, 67.2 kg P2O5 ha−1 and 33.6 kgK2Oha−1 in the early spring (April–May). Corn in the fertilized treatments receives an additional 112 kgNha−1 of ammonium nitrate applied in bands 15 cm on either side of the row (2–5 cm depth) when the corn is at the 6-leaf stage (usually in early–mid June).								
Comments									

Crop	7	Corn	Yield	3.67 t/acre
Crop	8	Corn	Yield	2.25 t/acre
Crop	9	Corn	Yield	2.34 t/acre

Study ID	**201600200804**	**Study Area**	**Four Crop Rotation - Oat Year (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	4	Practice Name	Four Crop Rotation - Oat Year (Fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	The fertilized treatments of all four crops receive chemical fertilizer applications of 16.8 kgNha−1, 67.2 kg P2O5 ha−1 and 33.6 kgK2Oha−1 in the early spring (April–May). Corn in the fertilized treatments receives an additional 112 kgNha−1 of ammonium nitrate applied in bands 15 cm on either side of the row (2–5 cm depth) when the corn is at the 6-leaf stage (usually in early–mid June).								
Comments									

Crop	10	Oat	Yield
Crop	11	Oat	Yield
Crop	12	Oat	Yield

Study ID	**201600200805**	**Study Area**	**Four Crop Rotation - Alfalfa Year 1 (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	5	Practice Name	Four Crop Rotation - Alfalfa Year 1 (Fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	The fertilized treatments of all four crops receive chemical fertilizer applications of 16.8 kgNha−1, 67.2 kg P2O5 ha−1 and 33.6 kgK2Oha−1 in the early spring (April–May). Corn in the fertilized treatments receives an additional 112 kgNha−1 of ammonium nitrate applied in bands 15 cm on either side of the row (2–5 cm depth) when the corn is at the 6-leaf stage (usually in early–mid June).								
Comments									

Crop	13	Alfalfa	Yield
Crop	14	Alfalfa	Yield
Crop	15	Alfalfa	Yield

Study ID	**201600200806**	**Study Area**	**Four Crop Rotation - Alfalfa Year 2 (Fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	6	Practice Name	Four Crop Rotation - Alfalfa Year 2 (Fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NM-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	The fertilized treatments of all four crops receive chemical fertilizer applications of 16.8 kgNha−1, 67.2 kg P2O5 ha−1 and 33.6 kgK2Oha−1 in the early spring (April–May). Corn in the fertilized treatments receives an additional 112 kgNha−1 of ammonium nitrate applied in bands 15 cm on either side of the row (2–5 cm depth) when the corn is at the 6-leaf stage (usually in early–mid June).								
Comments									

Crop	16	Alfalfa	Yield		
Crop	17	Alfalfa	Yield		
Crop	18	Alfalfa	Yield		

Study ID	**201600200807**	**Study Area**	**Continuous Corn (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	7	Practice Name	Continuous Corn (Not-fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NF-CCN-CN-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	Not fertilized								
Comments									

Crop	19	Corn	Yield	0.47	t/acre
Crop	20	Corn	Yield	0.19	t/acre
Crop	21	Corn	Yield	0.08	t/acre

Study ID	**201600200808**	**Study Area**	**Continuous Bluegrass Sod (Not-fertilized)**	Area (ha)	0.09	Tillage	No-Till	Cover Crop	
Practice ID	8	Practice Name	Continuous Bluegrass Sod (Not-fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NF-CCN-NT-GHP-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	Not fertilized.								
Comments									

Crop	22	Bluegrass Sod	Yield	
Crop	23	Bluegrass Sod	Yield	
Crop	24	Bluegrass Sod	Yield	

Study ID	**201600200809**	**Study Area**	**Four Crop Rotation - Corn Year (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	9	Practice Name	Four Crop Rotation - Corn Year (Not-fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	Not fertilized.								
Comments									

Crop	25	Corn	Yield	2.29 t/acre
Crop	26	Corn	Yield	1.24 t/acre
Crop	27	Corn	Yield	1.28 t/acre

Study ID	**201600200810**	**Study Area**	**Four Crop Rotation - Oat Year (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	10	Practice Name	Four Crop Rotation - Oat Year (Not-fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	Not fertilized.								
Comments									

Crop	28	Oat	Yield
Crop	29	Oat	Yield
Crop	30	Oat	Yield

Study ID	**201600200811**	**Study Area**	**Four Crop Rotation - Alfalfa Year 1 (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	11	Practice Name	Four Crop Rotation - Alfalfa Year 1 (Not-fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	Not fertilized.								
Comments									

Crop	31	Alfalfa	Yield
Crop	32	Alfalfa	Yield
Crop	33	Alfalfa	Yield

Study ID	**201600200812**	**Study Area**	**Four Crop Rotation - Alfalfa Year 2 (Not-fertilized)**	Area (ha)	0.09	Tillage	Conventional	Cover Crop	
Practice ID	12	Practice Name	Four Crop Rotation - Alfalfa Year 2 (Not-fertilized)	General Practice	Crop Rotation, Fertilizer			Area Type	T
Category	Management	Study Focus	Crop Rotation, Fertilizer	Practice Overview	NF-CCN-CN-CEX-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Brookston clay loam (Orthic Humic Gleysol). The soil has an average root zone texture of 28% sand, 35% silt, 37% clay, an average organic carbon content in the Ap horizon of 2.0–2.5%								
Fertilizer	Not fertilized.								
Comments									

Crop	34	Alfalfa	Yield
Crop	35	Alfalfa	Yield
Crop	36	Alfalfa	Yield

Test Site ID	Test Site Name
2013005426	**Tan, C. S., 1998**

Location		Ontario	XX	CA

Study Citation	1998
	Tan, C. S., C. F. Drury, M. Soultani, I. J. vanWesenbeeck, H. Y. F. Ng, J. D. Gaynor and T. W. Welacky.
	Effect of controlled drainage and tillage on soil structure and tile drainage nitrate loss at the field scale.
	Water Sci. Tech. 38:103-110.
NRCS LRR	Canada
NRCS MLRA	Canada
HUC_10	-999999
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication
	Two field sites; one managed by conventional tillage (CT) and the second by no tillage (NT). Each site consisted of two plots, controlled drainage (CD) and free tile drainage (DR).
Crops	Soybeans
Study Duration	3 years

Summary

Conservation tillage had become an attractive form of agricultural management practices for corn and soybean production on heavy textured soil in southern Ontario because of the potential for improving soil quality. A controlled drainage system combined with conservation tillage practices has also been reported to improve water quality. In Southwestern Ontario, field scale on farm demonstration sites were established in a paired watershed (no-tillage vs. conventional tillage) on clay loam soil to study the effect of tillage system on soil structure and water quality. The sites included controlled drainage and free drainage systems to monitor their effect on nitrate in the tile drainage water. Soil structure, organic matter content and water storage in the soil profile were improved with no-tillage (NT) compared to conventional tillage (CT). No-tillage also increased earthworm populations. No-tillage was found to have higher tile drainage volume and nitrate loss which were attributed to an increase in soil macropores from earthworm activity. The controlled drainage system (CD) reduced nitrate loss in tile drainage water by 14% on CT site and 25.5% on NT site compared to corresponding free drainage system (DR) form May, 1985 to April 30, 1997. No-tillage farming practices are definitely enhanced by using a controlled drainage system for preventing excessive nitrate leaching through tile drainage. Average soybean yields for CT site were about 12 to 14% greater than the NT site in 1995 and 1996. However, drainage systems had very little effect on soybean yields in 1995 and 1996 due to extremely dry growing seasons.

Study ID	**201300542601**	**Study Area**	**CT - CD**	Area (ha)	2.27	Tillage	Conventional	Cover Crop	None
Practice ID	718	Practice Name	CT - CD	General Practice		Drainage Water Management		Area Type	T
Category	Management	Study Focus	Tillage, Controlled Drainage	Practice Overview		NC-CCN-CN-SB-ED			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	At the CT site, fertilizer (0-18-36) was broadcasted at a rate of 224 kg/ha and incorporated during the fall of 1994 and 1995.								
Comments	Controlled drainage and no-tillage were compared with their conventional alternatives on 2 sets of paired watersheds, each individual watershed being 5.62-ac in size. Each plot was 46 x 494m, and contained 5 subsurface drain tiles. Sample collection was based on flow volume with collection volumes varying by time of year and expected runoff volumes. Flow weighted mean nitrate concentrations were calculated from the sum of the nitrate loss over the period divided by the total flow volume. The 1995 and 1996 growing seasons were very dry, except for the month of September 1996, where 198 mm fell at the conventional tillage (CT) site, with only 74.6 mm at the no-till (NT) site.								

Crop	1	soybean	Yield	-999999	kg/ha
Crop	2	soybean	Yield	-999999	kg/ha
Crop	3	soybean	Yield	-999999	NA

Study ID	**201300542602**	**Study Area**	**CT - DR**	Area (ha)	2.27	Tillage	Conventional	Cover Crop	None
Practice ID	715	Practice Name	CT - DR	General Practice		Control		Area Type	C
Category	Management	Study Focus	Tillage, Controlled Drainage	Practice Overview		NC-CCN-CN-SB-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	At the CT site, fertilizer (0-18-36) was broadcasted at a rate of 224 kg/ha and incorporated during the fall of 1994 and 1995.								
Comments	Controlled drainage and no-tillage were compared with their conventional alternatives on 2 sets of paired watersheds, each individual watershed being 5.62-ac in size. Each plot was 46 x 494m, and contained 5 subsurface drain tiles. Sample collection was based on flow volume with collection volumes varying by time of year and expected runoff volumes. Flow weighted mean nitrate concentrations were calculated from the sum of the nitrate loss over the period divided by the total flow volume. The 1995 and 1996 growing seasons were very dry, except for the month of September 1996, where 198 mm fell at the conventional tillage (CT) site, with only 74.6 mm at the no-till (NT) site.								

Crop	1	soybean	Yield	-999999	kg/ha
Crop	2	soybean	Yield	-999999	kg/ha
Crop	3	soybean	Yield	-999999	NA

Study ID	**201300542603**	**Study Area**	**NT - CD**	Area (ha)	2.27	Tillage	No Till	Cover Crop	None
Practice ID	717	Practice Name	NT - CD	General Practice		Conservation Tillage and Drainage Water Management		Area Type	T
Category	Management	Study Focus	Tillage, Controlled Drainage	Practice Overview		NM-CCN-NT-SB-ED			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	At the NT site, fertilizer (6-36-18) was banded beside the seed at a rate of 185 kg/ha in 1995 and 1996. Hence, 11.1 kg/ha of N was added to the NT site and not the CT site.								
Comments	Controlled drainage and no-tillage were compared with their conventional alternatives on 2 sets of paired watersheds, each individual watershed being 5.62-ac in size. Each plot was 46 x 494m, and contained 5 subsurface drain tiles. Sample collection was based on flow volume with collection volumes varying by time of year and expected runoff volumes. Flow weighted mean nitrate concentrations were calculated from the sum of the nitrate loss over the period divided by the total flow volume. The 1995 and 1996 growing seasons were very dry, except for the month of September 1996, where 198 mm fell at the conventional tillage (CT) site, with only 74.6 mm at the no-till (NT) site.								

Crop	1	soybean	Yield	-999999	kg/ha

Crop	2	soybean	Yield	-999999	kg/ha
Crop	3	soybean	Yield	-999999	NA

Study ID	**201300542604**	**Study Area**	**NT - DR**	Area (ha)	2.27	Tillage	No Till	Cover Crop	None
Practice ID	716	Practice Name	NT - DR	General Practice		Conservation Tillage		Area Type	T
Category	Management	Study Focus	Tillage, Controlled Drainage	Practice Overview		NM-CCN-NT-SB-EN			
Irrigation	No	Irrig. Descrip.	N/A (rainfall)						
Soils	Brookston clay loam (Typic Argiaquoll)								
Fertilizer	At the NT site, fertilizer (6-36-18) was banded beside the seed at a rate of 185 kg/ha in 1995 and 1996. Hence, 11.1 kg/ha of N was added to the NT site and not the CT site.								
Comments	Controlled drainage and no-tillage were compared with their conventional alternatives on 2 sets of paired watersheds, each individual watershed being 5.62-ac in size. Each plot was 46 x 494m, and contained 5 subsurface drain tiles. Sample collection was based on flow volume with collection volumes varying by time of year and expected runoff volumes. Flow weighted mean nitrate concentrations were calculated from the sum of the nitrate loss over the period divided by the total flow volume. The 1995 and 1996 growing seasons were very dry, except for the month of September 1996, where 198 mm fell at the conventional tillage (CT) site, with only 74.6 mm at the no-till (NT) site.								

Crop	1	soybean	Yield	-999999	kg/ha
Crop	2	soybean	Yield	-999999	kg/ha
Crop	3	soybean	Yield	-999999	NA

Test Site ID	Test Site Name
2016002007	**Tomer and Liebman, 2014**

Location		Boone	IA	US
Study Citation	2014			
	Tomer, M. D., Liebman, M.			
	Nutrients in soil water under three rotational cropping systems, Iowa, USA			
	Agriculture, Ecosystems and Environment			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0708010503	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	randomized complete block design w replication			
Crops	Corn-Soybean, Corn-Soybean-Small Grain/Legume, Corn-Soybean-Small G			
Study Duration	8 years			

Summary

This study tracked NO3-N and P in soil water under three cropping systems suited for the U.S. Midwest, including two-year (corn–soybean; 2YS), three-year (corn–soybean–small grain/red clover; 3YS), and four-year (corn–soybean–small grain/alfalfa–alfalfa; 4YS) systems. Soil water was collected from 2004 through 2011 using suction samplers. The 4YS system had smaller concentrations of NO3-N and a lower frequency of P detection ($p < 0.05$) during the established alfalfa and subsequent corn crop than other crop-years in the experiment. Mean concentrations of NO3-N were 1.1 mg NO3-N L−1 under alfalfa and 6.5 mg NO3-N L−1 under the following 4YS corn crop, compared to average concentrations between 8.7 and 18.1 mg NO3-N L−1 among all other crop-years. Results provide evidence that rotational systems including alfalfa with annual crops and use of soil testing in nutrient management can reduce movement of N and P below the root zone.

Study ID	**201600200701**	**Study Area**	**Two Year Rotation, Corn Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	1	Practice Name	Two Year Rotation, Corn Years	General Practice	Crop Rotation	Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CS-EN		
Irrigation	Unknown	Irrig. Descrip.					
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series						
Fertilizer							
Comments	Conventional corn-soybean crop rotation.						

Crop	1	Corn	Yield
Crop	2	Corn	Yield
Crop	3	Corn	Yield
Crop	4	Corn	Yield

Crop	5	Corn	Yield
Crop	6	Corn	Yield
Crop	7	Corn	Yield
Crop	8	Corn	Yield

Study ID	**201600200702**	**Study Area**	**Two Year Rotation, Soybean Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	2	Practice Name	Two Year Rotation, Soybean Years	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CS-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series								
Fertilizer									
Comments	Conventional corn-soybean crop rotation.								

Crop	9	Soybean	Yield
Crop	10	Soybean	Yield
Crop	11	Soybean	Yield
Crop	12	Soybean	Yield
Crop	13	Soybean	Yield
Crop	14	Soybean	Yield
Crop	15	Soybean	Yield
Crop	16	Soybean	Yield

Study ID	**201600200703**	**Study Area**	**Three Year Rotation, Corn Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	3	Practice Name	Three Year Rotation, Corn Years	General Practice	Crop Rotation	Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN		
Irrigation	Unknown	Irrig. Descrip.					
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series						
Fertilizer							
Comments	Represent crop production systems integrated with onsite livestock. Legumes included for soil improvement.						

Crop	17	Corn	Yield
Crop	18	Corn	Yield
Crop	19	Corn	Yield
Crop	20	Corn	Yield
Crop	21	Corn	Yield
Crop	22	Corn	Yield

Study ID	**201600200704**	**Study Area**	**Three Year Rotation, Soybean Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	4	Practice Name	Three Year Rotation, Soybean Years	General Practice	Crop Rotation	Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN		
Irrigation	Unknown	Irrig. Descrip.					
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series						
Fertilizer							
Comments	Represent crop production systems integrated with onsite livestock. Legumes included for soil improvement.						

Crop	23	Soybean	Yield
Crop	24	Soybean	Yield
Crop	25	Soybean	Yield
Crop	26	Soybean	Yield

Crop	27	Soybean		Yield					
Study ID	**201600200705**	**Study Area**	**Three Year Rotation, Small Grain/Legume Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	5	Practice Name	Three Year Rotation, Small Grain/Legume Years	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series								
Fertilizer									
Comments	Represent crop production systems integrated with onsite livestock. Legumes included for soil improvement.								
Crop	28	Small Grain		Yield					
Crop	29	Small Grain		Yield					
Crop	30	Small Grain		Yield					
Crop	31	Small Grain		Yield					
Crop	32	Small Grain		Yield					
Study ID	**201600200706**	**Study Area**	**Four Year Rotation, Corn Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	6	Practice Name	Four Year Rotation, Corn Years	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series								
Fertilizer									
Comments	Represent crop production systems integrated with onsite livestock. Legumes included as a foraging crop.								
Crop	33	Corn		Yield					
Crop	34	Corn		Yield					
Crop	35	Corn		Yield					
Crop	36	Corn		Yield					

Study ID	**201600200707**	**Study Area**	**Four Year Rotation, Soybean Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	7	Practice Name	Four Year Rotation, Soybean Years	General Practice	Crop Rotation	Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN		
Irrigation	Unknown	Irrig. Descrip.					
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series						
Fertilizer							
Comments	Represent crop production systems integrated with onsite livestock. Legumes included as a foraging crop.						

Crop	37	Soybean	Yield
Crop	38	Soybean	Yield
Crop	39	Soybean	Yield
Crop	40	Soybean	Yield

Study ID	**201600200708**	**Study Area**	**Four Year Rotation, Small Grain/Legume Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	8	Practice Name	Four Year Rotation, Small Grain/Legume Years	General Practice	Crop Rotation	Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN		
Irrigation	Unknown	Irrig. Descrip.					
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series						
Fertilizer							
Comments	Represent crop production systems integrated with onsite livestock. Legumes included as a foraging crop.						

Crop	41	Small Grain	Yield
Crop	42	Small Grain	Yield
Crop	43	Small Grain	Yield
Crop	44	Small Grain	Yield

Study ID	**201600200709**	**Study Area**	**Four Year Rotation, Alfalfa Years**	Area (ha)	-99.00	Tillage	Not specified	Cover Crop	
Practice ID	9	Practice Name	Four Year Rotation, Alfalfa Years	General Practice	Crop Rotation			Area Type	T
Category	Management	Study Focus	Crop Rotation	Practice Overview	NM-CCN-UT-CSX-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Soil types were moderately well drained Clarion (Typic Hapludoll), some-what poorly drained Nicollet (Aquic Hapludoll), and poorly drained Webster, Canisteo (both Typic Endoaquolls) and Harps (Typic Cal-ciaquoll) series								
Fertilizer									
Comments	Represent crop production systems integrated with onsite livestock. Legumes included as a foraging crop.								

Crop	45	Alfalfa	Yield
Crop	46	Alfalfa	Yield
Crop	47	Alfalfa	Yield
Crop	48	Alfalfa	Yield

Test Site ID	Test Site Name
2013007038	Udawatta et al. 2002

Location		Knox County	MO	US
Study Citation	2002			
	Udawatta, R.P., J.J. Krstansky, G.S. Henderson, and H.E. Garrett.			
	Agroforestry Practices, Runoff, and Nutrient Loss: A Paired Watershed Comparison			
	J. Environ. Qual. 31: 1214-1225			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Claypan Areas			
HUC_10	0711000303	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	A paired watershed study			
Crops	Corn, Soybeans			
Study Duration	3 years			

Summary

A paired watershed study consisting of agroforestry (trees plus grass buffer strips), contour strips (grass buffer strips), and control treatments with a corn –soybean rotation was used to examine treatment effects on runoff, sediment, and nutrient losses. During the (1991–1997) calibration and subsequent three-year treatment periods, runoff was measured in 0.91 and 1.37-m H-flumes with bubbler flow meters. Composite samples were analyzed for sediment, total phosphorus (TP), total nitrogen (TN), nitrate, and ammonium. The contour strip and agroforestry treatments reduced runoff by 10 and 1% during the treatment period. In both treatments, most runoff reductions occurred in the second and third years after treatment establishment. The contour strip treatment reduced erosion by 19% in 1999, while erosion in the agroforestry treatment exceeded the predicted loss. Treatments reduced TP loss by 8 and 17% on contour strip and agroforestry watersheds. Treatments did not result in reductions in TN during the first two years of the treatment period. The contour strip and agroforestry treatments reduced TN loss by 21 and 20%, respectively, during a large precipitation event in the third year. During the third year of treatments, nitrate N loss was reduced 24 and 37% by contour strip and agroforestry treatments. Contour strip and agroforestry management practices effectively reduced nonpoint-source pollution in runoff from a corn–soybean rotation in the clay pan soils of northeastern Missouri.

Study ID	**201300703801**	**Study Area**	**Control**	Area (ha)	1.65	Tillage	NT	Cover Crop	
Practice ID	1	Practice Name	Control	General Practice	Control			Area Type	C
Category	Structural	Study Focus	Buffer	Practice Overview	NF-CCN-NT-CS-EN				
Irrigation	No	Irrig. Descrip.	Not applicable						
Soils	The watersheds are underlain by glacial and loess material. Soils are mapped as Putnam silt loam (fine, smectitic, mesic Vertic Albaqualf) and Kilwinning silt loam (fine, smectitic, Vertic Albaqualf). Putnam occurs on nearly level (0–1%) slope portions of								
Fertilizer	None								
Comments									

Crop	1	Soybean	Yield	42	bushels/acre
Crop	2	Corn	Yield	80	bushels/acre
Crop	3	Soybean	Yield	28	bushels/acre
Crop	4	Corn	Yield	162	bushels/acre

Study ID	**201300703802**	**Study Area**	**Agroforestry**	Area (ha)	4.44	Tillage	NT	Cover Crop	
Practice ID	2	Practice Name	Agroforestry	General Practice	Riparian Buffer	Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NF-CCN-NT-CS-EB		
Irrigation	No	Irrig. Descrip.	Not applicable				
Soils	The watersheds are underlain by glacial and loess material. Soils are mapped as Putnam silt loam (fine, smectitic, mesic Vertic Albaqualf) and Kilwinning silt loam (fine, smectitic, Vertic Albaqualf). Putnam occurs on nearly level (0–1%) slope portions of						
Fertilizer	None						
Comments	Contour grass–legume strips (4.5 m [15 ft.] wide) consisting of redtop (Agrostis gigantea Roth), brome grass (Bromus spp.), and birdsfoot trefoil (Lotus corniculatus L.) were established at 36.5 m (some in lower slope positions were 22.8 m apart) intervals on the agroforestry and contour strip watersheds in June 1997 (Fig. 1). Pin oak (Quercus palustris Muenchh.), swamp white oak (Q. bicolor Willd.), and bur oak (Q. macrocarpa Michx.) were planted 3 m apart down the center of the grass–legume strips of the agroforestry watershed in November 1997. Trees had almost 100% survival in spite of deer damage and a severe drought in 1999. Only one pin oak tree was replaced, in May 2000. In 1999, welded wire fences (5-cm mesh,1 m in diameter) were installed to protect trees from deer damage.						

Crop	1	Soybean	Yield	42	bushels/acre
Crop	2	Corn	Yield	80	bushels/acre
Crop	3	Soybean	Yield	28	bushels/acre
Crop	4	Corn	Yield	162	bushels/acre

Study ID	**201300703803**	**Study Area**	**Contour Strip**	Area (ha)	3.16	Tillage	NT	Cover Crop	
Practice ID	3	Practice Name	Contour Strip	General Practice	Filter Strip	Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NC-CCN-NT-CS-EB		
Irrigation	No	Irrig. Descrip.	Not applicable				
Soils	The watersheds are underlain by glacial and loess material. Soils are mapped as Putnam silt loam (fine, smectitic, mesic Vertic Albaqualf) and Kilwinning silt loam (fine, smectitic, Vertic Albaqualf). Putnam occurs on nearly level (0–1%) slope portions of						
Fertilizer	160–50–100						
Comments	Contour grass–legume strips (4.5 m [15 ft.] wide) consisting of redtop (Agrostis gigantea Roth), brome grass (Bromus spp.), and birdsfoot trefoil (Lotus corniculatus L.) were established at 36.5 m (some in lower slope positions were 22.8 m apart) intervals on the agroforestry and contour strip watersheds in June 1997 (Fig. 1).						

Crop	1	Soybean	Yield	42	bushels/acre
Crop	2	Corn	Yield	80	bushels/acre
Crop	3	Soybean	Yield	28	bushels/acre
Crop	4	Corn	Yield	162	bushels/acre

Test Site ID	Test Site Name
2013007037	Udawatta et al. 2004

Location		Knox County	MO	US
Study Citation	2004			
	Udawatta, R.P, P.P. Motavalli, and H.E. Garrett.			
	Phosphorus Loss and Runoff Characteristics in Three Adjacent Agricultural Watersheds with Claypan Soils			
	J. Environ. Qual. 33: 1709-1719			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Claypan Areas			
HUC_10	0711000303	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	Effects of precipitation, runoff, and management on total phosphorus (TP) loss from three watersheds were examined from 1991 to 1997 to understand factors affecting P loss in watersheds dominated by claypan soils.			
Crops	Corn, Soybeans			
Study Duration	7 years			

Summary

Effects of precipitation, runoff, and management on total phosphorus (TP) loss from three adjacent, row-cropped watersheds in the claypan region of northeastern Missouri were examined from 1991 to 1997 to understand factors affecting P loss in watersheds dominated by claypan soils. Runoff samples from each individual runoff event were analyzed for TP and sediment concentration. The annual TP loss ranged from 0.29 to 3.59 kg/ha with a mean of 1.36 kg/ha across all the watersheds during the study period. Significantly higher loss of TP from the watersheds was observed during the fallow period. Multiple small runoff events or several large runoff events contributed to loss of TP from the watersheds. Total P loss in 1993, a year with above-normal precipitation, accounted for 30% of the total TP loss observed over seven years. The five largest runoff events out of a total of 66 events observed over seven years accounted for 27% of the TP loss. The five largest sediment losses were responsible for 24% of the TP loss over seven years. Runoff volume and sediment loss explained 64 to 73% and 47 to 58% of the variation in TP loss on watersheds during the study. Flow duration and maximum flow accounted for 49 and 66% of TP loss, respectively. The results of this study suggest that management practices that reduce runoff volume, flow duration, maximum flow, and sediment loss, and that maintain a suitable vegetative cover throughout the year could lower P loss in claypan soils.

Study ID	201300703701	Study Area	East	Area (ha)	1.65	Tillage	No Till	Cover Crop	
Practice ID	1	Practice Name	Overall_East	General Practice		Conservation Tillage and Grassed Waterway		Area Type	T
Category	Management/Str	Study Focus	General, Contour Planting, Tillage, Grass Waterway	Practice Overview		NC-CCN-NT-CS-EG			
Irrigation	No	Irrig. Descrip.	Not applicable						

Soils	The watersheds are underlain by glacial and loess material. Soils are mapped as Putnam silt loam (fine, smectitic, mesic Vertic Albaqualf) and Kilwinning silt loam (fine, smectitic, Vertic Albaqualf). Putnam occurs on nearly level (0–1%) slope portions of
Fertilizer	1991-1997: 1991-not available; 1992-soybean-none; 1993-corn-160-50-100; 1994-soybean-none; 1995-soybean(other varieties) 0-40-120; 1996-corn-59-0-0; 1997-soybean-none.
Comments	Beginning in 1991, planting was in a straight row perpendicular to the slope and then beginning in 1996 was on the contour. During the study period, the land preparation method was no-till with the exception of 1992 when watersheds were field-cultivated with a John Deere (Moline, IL) E1000 field cultivator. Each watershed is drained by a grass waterway that leads into a concrete approach structure and an H-flume. The east watershed has a 0.91-m flume while the other two watersheds have 1.37-m flumes.

Crop	1	Corn	Yield	-999999	bushels/acre
Crop	2	Soybean	Yield	25	bushels/acre
Crop	3	Corn	Yield	130	bushels/acre
Crop	4	Soybean	Yield	55	bushels/acre
Crop	5	Soybean	Yield	42.4	bushels/acre
Crop	6	Corn	Yield	170	bushels/acre
Crop	7	Soybean	Yield	42	bushels/acre

Study ID	**201300703702**	**Study Area**	**Center**	Area (ha)	4.44	Tillage	No Till	Cover Crop	
Practice ID	2	Practice Name	Overall_Center	General Practice	Conservation Tillage and Grassed Waterway			Area Type	T
Category	Management/Str	Study Focus	General, Contour Planting, Tillage, Grass Waterway	Practice Overview	NC-CCN-NT-CS-EG				
Irrigation	No	Irrig. Descrip.	Not applicable						

Soils	The watersheds are underlain by glacial and loess material. Soils are mapped as Putnam silt loam (fine, smectitic, mesic Vertic Albaqualf) and Kilwinning silt loam (fine, smectitic, Vertic Albaqualf). Putnam occurs on nearly level (0–1%) slope portions of
Fertilizer	1991-1997: 1991-not available; 1992-soybean-none; 1993-corn-160-50-100; 1994-soybean-none; 1995-soybean(other varieties) 0-40-120; 1996-corn-59-0-0; 1997-soybean-none.
Comments	Beginning in 1991, planting was in a straight row perpendicular to the slope and then beginning in 1996 was on the contour. During the study period, the land preparation method was no-till with the exception of 1992 when watersheds were field-cultivated with a John Deere (Moline, IL) E1000 field cultivator. Each watershed is drained by a grass waterway that leads into a concrete approach structure and an H-flume. The east watershed has a 0.91-m flume while the other two watersheds have 1.37-m flumes.

Crop	1	Corn	Yield	-999999	bushels/acre
Crop	2	Soybean	Yield	25	bushels/acre
Crop	3	Corn	Yield	130	bushels/acre
Crop	4	Soybean	Yield	55	bushels/acre
Crop	5	Soybean	Yield	31.7	bushels/acre
Crop	6	Corn	Yield	170	bushels/acre
Crop	7	Soybean	Yield	42	bushels/acre

Study ID	**201300703703**	**Study Area**	**West**	Area (ha)	3.16	Tillage	No Till	Cover Crop	
Practice ID	3	Practice Name	Overall_West	General Practice	Conservation Tillage and Grassed Waterway			Area Type	T
Category	Management/Str	Study Focus	General, Contour Planting, Tillage, Grass Waterway	Practice Overview	NC-CCN-NT-CS-EG				
Irrigation	No	Irrig. Descrip.	Not applicable						
Soils	The watersheds are underlain by glacial and loess material. Soils are mapped as Putnam silt loam (fine, smectitic, mesic Vertic Albaqualf) and Kilwinning silt loam (fine, smectitic, Vertic Albaqualf). Putnam occurs on nearly level (0–1%) slope portions of								
Fertilizer	1991-1997: 1991-not available; 1992-soybean-none; 1993-corn-160-50-100; 1994-soybean-none; 1995-soybean(other varieties) 0-40-120; 1996-corn-59-0-0; 1997-soybean-none.								
Comments	Beginning in 1991, planting was in a straight row perpendicular to the slope and then beginning in 1996 was on the contour. During the study period, the land preparation method was no-till with the exception of 1992 when watersheds were field-cultivated with a John Deere (Moline, IL) E1000 field cultivator. Each watershed is drained by a grass waterway that leads into a concrete approach structure and an H-flume. The east watershed has a 0.91-m flume while the other two watersheds have 1.37-m flumes.								

Crop	1	Corn	Yield	-999999	bushels/acre
Crop	2	Soybean	Yield	25	bushels/acre
Crop	3	Corn	Yield	130	bushels/acre
Crop	4	Soybean	Yield	55	bushels/acre
Crop	5	Soybean	Yield	24.1	bushels/acre
Crop	6	Corn	Yield	170	bushels/acre
Crop	7	Soybean	Yield	42	bushels/acre

Test Site ID	Test Site Name
2013001002	**UMES Research Farm**

Location	Princess Anne	Somerset	MD	US

Study Citation	2012
	Bryant, Ray B.; Anthony R. Budaa, Peter J.A. Kleinmana, Clinton D. Churcha, Louis S. Saporitoa,Gordon J. Folmara, Salil Boseb and Arthur L. Allenc
	Using Flue Gas Desulfurization Gypsum to Remove Dissolved Phosphorus from Agricultural Drainage Waters
NRCS LRR	Atlantic and Gulf Coast Lowland Forest and Crop Region
NRCS MLRA	Northern Tidewater Area
HUC_10	0208011004 Test Site Scale Field
Experimental Design Type/ Description	Inflow-Outflow
	The specific objectives of this study were to design, build, and monitor the effectiveness of an in-ditch filter to remove dissolved P, thereby reducing nonpoint source P losses from upstream agricultural fields.
Crops	Corn, Soybeans
Study Duration	4 years

Summary

110 Mg of flue gas desulfurization (FGD) gypsum and 5 Mg of sand were used as the reactive ingredients in a ditch filter. The ditch filter was monitored from 2007 to 2010, during which time 29 storm-induced flow events were characterized. To avoid flooding during large storm events, the gypsum ditch filter was designed to allow excess flow to spill over and bypass the filter. To measure bypass flow during large flow events, a compound V-notch, straight-walled weir was used to block flow and to establish a hydrologic head above the filtration bed. After the weir was installed, gabions (rock-filled wire cages) were placed behind the weir to hold it in place and to prevent erosion of the ditch side walls. A manifold, placed in front of the weir, was connected to a drain pipe, which routed the filtered effluent underground around the weir and through a partially buried metal box that provided access to flow monitoring and sampling equipment. The filter bed consists of six 30-m-long, 10-cm-diameter tile lines that were encased in cylindrically shaped filter fabric, attached to the manifold, and sandwiched within a layer of sand with FGD gypsum above (25 cm thick) and below (10 cm thick). A coconut fiber erosion control mat stabilized the surface of the bed until vegetation established by natural succession.

Study ID	**201300100201**	**Study Area**	**UMES Research Farm**	Area (ha)	17.00	Tillage	No Till	Cover Crop	Winter Wheat
Practice ID	1	Practice Name	Flue Gas Desulfurization Gypsum	General Practice	Ditch Filter			Area Type	T
Category	Structural	Study Focus	Ditch Filter	Practice Overview	NM-CCY-NT-CS-EO				
Irrigation	No	Irrig. Descrip.	Not applicable						

Soils	Soils in the drainage area have silt loam surface horizons and well structured, silty clay loam, argillic, subsurface horizons that favor preferential flow. Below a depth of approximately 50 cm, the argillic horizon transitions to highly permeable, mediu
Fertilizer	For the 17-ha area drained by the ditch, poultry litter applied only in 2009 at 0.5 Mg/ha. Applied and incorporated before planting. Soil test: Mehlich 3 (equivalent) 450 mg/k (in 2007 prior to study).
Comments	Flue gas desulfurization gypsum (110 Mg) and sand (5 Mg) were used in the construction of the filter bed (Fig. 3). To avoid flooding during large storm events, the gypsum ditch filter was designed to allow excess flow to spill over and bypass the filter. To measure bypass flow during large flow events, a compound V-notch, straight-walled weir was used to block flow and to establish a hydrologic head above the filtration bed. After the weir was installed, gabions (rock-filled wire cages) were placed behind the weir to hold it in place and to prevent erosion of the ditch side walls. A manifold, placed in front of the weir, was connected to a drain pipe, which routed the filtered effluent underground around the weir and through a partially buried metal box that provided access to flow monitoring and sampling equipment. The filter bed consists of six 30-m-long, 10-cm-diameter tile lines that were encased in cylindrically shaped filter fabric, attached to the manifold, and sandwiched within a layer of sand with FGD gypsum above (25 cm thick) and below (10 cm thick). A coconut fiber erosion control mat stabilized the surface of the bed until vegetation established by natural succession.

Crop	1	Corn	Yield	-999999
Crop	2	Soybean	Yield	-999999

Test Site ID	Test Site Name
2013007001	**Van Vliet et al. 2002**

Location	Agassiz	British Columbia	XX	CA
Study Citation	2002			
	Van Vliet, L.J.P., B.J. Zebarth, and G. Derksen.			
	Effect of Fall-Applied Manure Practices on Runoff, Sediment, and Nutrient Surface Transport from Silage Corn in South Coastal British Columbia			
	Can. J. Soil Sci. 82:445-456			
NRCS LRR	Canada			
NRCS MLRA	Canada			
HUC_10	-999999	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control, No Replication			
	plot study: complete randomized block			
Crops	Corn			
Study Duration	2 years			

Summary

Runoff from manured cropland during the wet fall and winter season, when 70% of the annual rainfall occurs, is a surface water quality concern in the Lower Fraser Valley of British Columbia. This study compares different fall-manure application strategies on runoff and contaminant transport from silage com (Zea mays) land. The treatments were (i) a control, which did not receive manure in the fall; (ii) manure broadcast in the fall on corn stubble; and (iii) manure broadcast in the fall on com stubble with an established relay crop. Runoff, solids, and nutrients loads from natural precipitation were measured on replicated experimental plots (0.0125 ha) from 1996 to 1998. Fall-applied manure on 3-5% sloping silage cornland without a relay crop resulted in a high risk to surface water quality, due to high suspended solid loads of between 7 and 14 Mg ha-1 yr1 and high nutrient transport with mean annual total Kjeldahl N (TKN) P, and K loads of 98, 21, and 63 kg/ha, respectively. Compared with no relay crop, intercropping silage com with a relay crop of Italian ryegrass (Lolium multijlorum) reduced the mean annual runoff and suspended solid load by 53 and 74%, respectively, TKN load by 56%, P load by 42%, K load by 31 %, and Cu load by 57%. Even though total nutrient loads were lower with the relay crop treatment, all fall manure treatments including the relay crop resulted in nutrient loads above guidelines for the first three runoff events immediately following application.

Study ID	**201300700101**	**Study Area**	**CT**	Area (ha)	0.01	Tillage	Disked	Cover Crop	None
Practice ID	1	Practice Name	CT	General Practice		Control		Area Type	C
Category	Management	Study Focus	Fertilizer, Cover Crop	Practice Overview		NM-CCN-CT-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Fairfield								
Fertilizer	In the spring, potassium (KCl) fertilizer (N-P2O-K2O ratio of 0-0-60) was broadcast on all six plots at a rate of 100 kg/ha prior to manure application. No fall manure application.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn for Silage	Yield	-999999	NA
Crop	2	Corn for Silage	Yield	-999999	NA

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300700102**	**Study Area**	**CP**	Area (ha)	0.01	Tillage	Disked	Cover Crop	None
Practice ID	2	Practice Name	CP	General Practice	Fertilizer			Area Type	T
Category	Management	Study Focus	Fertilizer, Cover Crop	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Fairfield								
Fertilizer	In the spring, potassium (KCl) fertilizer (N-P2O-K2O ratio of 0-0-60) was broadcast on all six plots at a rate of 100 kg/ha prior to manure application. Liquid dairy manure broadcast on corn stubble in the fall following a silage corn harvest and not incorporated								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn for Silage	Yield	-999999	NA
Crop	2	Corn for Silage	Yield	-999999	NA

Study ID	**201300700103**	**Study Area**	**RC**	Area (ha)	0.01	Tillage	Disked	Cover Crop	Italian ryegrass
Practice ID	3	Practice Name	RC	General Practice	Fertilizer, Cover Crop			Area Type	T
Category	Management	Study Focus	Fertilizer, Cover Crop	Practice Overview	NC-CCY-CT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silt Loam- Fairfield								
Fertilizer	In the spring, potassium (KCl) fertilizer (N-P2O-K2O ratio of 0-0-60) was broadcast on all six plots at a rate of 100 kg/ha prior to manure application. Fall-applied liquid dairy manure broadcast on corn stubble an not incorporated								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn for Silage (with Italian ryegrass rela	Yield	-999999	NA
Crop	2	Corn for Silage (with Italian ryegrass rela	Yield	-999999	NA

Test Site ID	Test Site Name
2016002005	**Webster and Shaw 1996**

Location		Noxubee	MS	US
Study Citation	1996			
	Webster, E. P. and Shaw, D. R.			
	Impact of Vegetative Filter Strips on Herbicide Loss in Runoff from Soybean (Glycine max)			
	Weed Science			
NRCS LRR	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region			
NRCS MLRA	Southern Coastal Plain			
HUC_10	0316010603	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, With Control)			
	Three production systems (NT monocrop, CT monocrop, and NT double crop) each with and without a vegetated filter strip were monitored for a total of six plots. Plots were not replicated.			
Crops	Soybean and Soybean/Wheat			
Study Duration	3 years			

Summary

Metolachlor and metribuzin loss in runoff was determined in three soybean tillage systems with and without a 4 by 2 m tall fescue vegetative filter strip. Soil erosion plots were 4 by 22 m with 3% slope. Analysis of covariance indicated no difference in concentration of metolachlor or metribuzin in runoff from the three tillage systems within any vegetative filter strip treatment. When a vegetative filter strip was present, losses of metribuzin and metolachlor were reduced over 85% in 1993, and totaled 1.2 and 0.5%, respectively, of the amount applied. The vegetative filter strip reduced herbicide and suspended solids from runoff produced by a conventional-till production system to levels equal to or lower than a no-till double crop system..

Study ID	**201600200501**	**Study Area**	**No Till Monocrop - Control**	Area (ha)	0.01	Tillage	No-Till	Cover Crop	
Practice ID	1	Practice Name	No Till Monocrop - Control	General Practice		Conservation Tillage		Area Type	C
Category	Management	Study Focus	Buffer	Practice Overview		NF-CCN-NT-SB-EN			
Irrigation	Yes	Irrig. Descrip.							
Soils	Brooksville silty clay (fine montmorillonitic, thermic Aquic Chromudert; 3.2% organic matter and pH 6.4 in the Ap horizon)								
Fertilizer	None identified for soybean crop.								
Comments	Conservation tillage treatment (conservation tillage).								

Crop	1	Soybean	Yield

Study ID	**201600200502**	**Study Area**	**No Till Monocrop - Filter Strip**	Area (ha)	0.01	Tillage	No-Till	Cover Crop	
Practice ID	2	Practice Name	No Till Monocrop - Filter Strip	General Practice	Conservation Tillage, Filter Strip			Area Type	T
Category	Management/Str	Study Focus	Buffer	Practice Overview	NF-CCN-NT-SB-EB				
Irrigation	Yes	Irrig. Descrip.							
Soils	Brooksville silty clay (fine montmorillonitic, thermic Aquic Chromudert; 3.2% organic matter and pH 6.4 in the Ap horizon)								
Fertilizer	None identified for soybean crop.								
Comments	Conservation tillage and filter strip treatment (multiple practices).								
Crop	2	Soybean		Yield					

Study ID	**201600200503**	**Study Area**	**Conventional Till Monocrop - Control**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	
Practice ID	3	Practice Name	Conventional Till Monocrop - Control	General Practice	Control			Area Type	C
Category	Management	Study Focus	Buffer	Practice Overview	NF-CCN-CN-SB-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	Brooksville silty clay (fine montmorillonitic, thermic Aquic Chromudert; 3.2% organic matter and pH 6.4 in the Ap horizon)								
Fertilizer	None identified for soybean crop.								
Comments	Conventional tillage treatment (control)								
Crop	3	Soybean		Yield					

Study ID	**201600200504**	**Study Area**	**Conventional Till Monocrop - Filter Strip**	Area (ha)	0.01	Tillage	Conventional	Cover Crop	
Practice ID	4	Practice Name	Conventional Till Monocrop - Filter Strip	General Practice	Filter Strip			Area Type	T
Category	Structural	Study Focus	Buffer	Practice Overview	NF-CCN-CN-SB-EB				
Irrigation	Yes	Irrig. Descrip.							
Soils	Brooksville silty clay (fine montmorillonitic, thermic Aquic Chromudert; 3.2% organic matter and pH 6.4 in the Ap horizon)								
Fertilizer	None identified for soybean crop.								
Comments	Conventional tillage with filter strip treatment (filter strip)								
Crop	4	Soybean		Yield					

Study ID	**201600200505**	**Study Area**	**No Till Doublecrop - Control**	Area (ha)	0.01	Tillage	No-Till	Cover Crop	
Practice ID	5	Practice Name	No Till Doublecrop - Control	General Practice	Conservation Tillage, Cropping System			Area Type	C
Category	Management	Study Focus	Buffer	Practice Overview	NF-CCN-NT-SB-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	Brooksville silty clay (fine montmorillonitic, thermic Aquic Chromudert; 3.2% organic matter and pH 6.4 in the Ap horizon)								
Fertilizer	None identified for soybean crop.								
Comments	Conservation tillage and crop management treatment (multiple practices)								

Crop	5	Soybean	Yield
Crop	6	Wheat	Yield

Study ID	**201600200506**	**Study Area**	**No Till Doublecrop - Filter Strip**	Area (ha)	0.01	Tillage	No-Till	Cover Crop	
Practice ID	6	Practice Name	No Till Doublecrop - Filter Strip	General Practice	Conservation Tillage, Cropping System, Filter Strip			Area Type	T
Category	Management/Str	Study Focus	Buffer	Practice Overview	NF-CCN-NT-SB-EB				
Irrigation	Yes	Irrig. Descrip.							
Soils	Brooksville silty clay (fine montmorillonitic, thermic Aquic Chromudert; 3.2% organic matter and pH 6.4 in the Ap horizon)								
Fertilizer	None identified for soybean crop.								
Comments	Conservation tillage, crop management, and filter strip treatment (multiple practices)								

Crop	7	Soybean	Yield
Crop	8	Wheat	Yield

Test Site ID	Test Site Name
2013005473	Willis, G. H., 1997

Location	Baton Rouge	East Baton Rouge	LA	US
Study Citation	1997			
	Willis, G. H., L. M. Southwick, J. L. Fouss, C. E. Carter and J. S. Rogers.			
	Nitrate losses in runoff and subsurface drain effluent from controlled-water-table plots.			
	Bull. Environ. Contam. Toxicol. 58:566-573.			
NRCS LRR	South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region			
NRCS MLRA	Carolina and Georgia Sand Hills			
HUC_10	0807020208	Test Site Scale	Plot	
Experimental Design Type/ Description	plot study: complete randomized block			
Crops	Corn			
Study Duration	2 years			

Summary

This paper reports the concentrations and loads of nitrate in runoff and subsurface drain effluent from controlled-water table plots located on alluvial soil in southern Louisiana. The study was conducted on sixteen 0.21-ha plots on the Louisiana Agricultural Experiment Station's Ben Hur Farm near Baton Rouge from April, 1995 till mid-March, 1996. Four replications of four water table management treatments were imposed on the plots: (1) surface drainage only (SUR) , (2) conventional subsurface drainage at 1.2 m or more below the soil surface (DRN), (3) controlled water table depth at 45 cm below the soil surface (CWT45), end (4) controlled water depth table at 75 cm below the soil surface (CWT75). Although N03-N concentrations were high on numerous occasions, the drain volumes were small, resulting in low total amounts lost in subsurface drain effluent.The results suggest that water table control is a promising tool for managing soil water to reduce agrochemical loads in surface and groundwaters on high-water-table soils. However, several more years of data under variable weather regimens, and dynamic adjustments to water table depths during the growing season, will be required before the full utility of the process can be evaluated.

Study ID	**201300547301**	**Study Area**	**SUR**	Area (ha)	0.21	Tillage	Not specified	Cover Crop	None
Practice ID	438	Practice Name	SUR	General Practice		Control		Area Type	C
Category	Management	Study Focus	Controlled Drainage	Practice Overview		NM-CCN-CT-CO-EN			
Irrigation	No	Irrig. Descrip.							

Soils: Commerce silt loam (Aeric Fluvaquent)

Fertilizer: A "starter" application of ammonium nitrate was applied at 56 kg N/ha on April 19 and was tilled into the top 7.5 to 10 cm of soil. A side-dress N application (84 kg N/ha) was made on May 17. On June 28 a third application (84 kg N/ha) was applied by aircraft; no tillage occurred.

Comments: This study was conducted on 16 0.21-ha plots. Three subsurface drains were installed 1.2 m below the soil surface. Field instrumentation included microprocessor-controlled water table management (drainage and/or sub irrigation), and automated measuring and sampling of runoff and drain line effluent. A starter nitrogen application at 56 kg/ha was tilled into the surface on April 19. Corn was planted on April 27. A sidedress of 84 kg N/ha was applied on May 17th and a third application of 84 kg N/ha was applied by airplane on June 28. The water table treatments were imposed on the day of planting and maintained until day 146, one day before corn harvest. Sampling of runoff went from day 0 to day 197; sampling of drain line effluent continued through day 328. Tillage treatments were the same for all plots.

Crop 1 Corn Yield -999999 NA

Study ID	**201300547302**	**Study Area**	**DNR**	Area (ha)	0.21	Tillage	Not specified	Cover Crop	None
Practice ID	439	Practice Name	DNR	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	Yes	Irrig. Descrip.							
Soils	Commerce silt loam (Aeric Fluvaquent)								
Fertilizer	A "starter" application of ammonium nitrate was applied at 56 kg N/ha on April 19 and was tilled into the top 7.5 to 10 cm of soil. A side-dress N application (84 kg N/ha) was made on May 17. On June 28 a third application (84 kg N/ha) was applied by aircraft; no tillage occurred.								
Comments	This study was conducted on 16 0.21-ha plots. Three subsurface drains were installed 1.2 m below the soil surface. Field instrumentation included microprocessor-controlled water table management (drainage and/or sub irrigation), and automated measuring and sampling of runoff and drain line effluent. A starter nitrogen application at 56 kg/ha was tilled into the surface on April 19. Corn was planted on April 27. A sidedress of 84 kg N/ha was applied on May 17th and a third application of 84 kg N/ha was applied by airplane on June 28. The water table treatments were imposed on the day of planting and maintained until day 146, one day before corn harvest. Sampling of runoff went from day 0 to day 197; sampling of drain line effluent continued through day 328. Tillage treatments were the same for all plots.								

Crop 1 Corn Yield -999999 NA

Study ID	**201300547303**	**Study Area**	**CWT45**	Area (ha)	0.21	Tillage	Not specified	Cover Crop	None
Practice ID	437	Practice Name	CWT45	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-ED				
Irrigation	Yes	Irrig. Descrip.							
Soils	Commerce silt loam (Aeric Fluvaquent)								
Fertilizer	A "starter" application of ammonium nitrate was applied at 56 kg N/ha on April 19 and was tilled into the top 7.5 to 10 cm of soil. A side-dress N application (84 kg N/ha) was made on May 17. On June 28 a third application (84 kg N/ha) was applied by aircraft; no tillage occurred.								
Comments	This study was conducted on 16 0.21-ha plots. Three subsurface drains were installed 1.2 m below the soil surface. Field instrumentation included microprocessor-controlled water table management (drainage and/or sub irrigation), and automated measuring and sampling of runoff and drain line effluent. A starter nitrogen application at 56 kg/ha was tilled into the surface on April 19. Corn was planted on April 27. A sidedress of 84 kg N/ha was applied on May 17th and a third application of 84 kg N/ha was applied by airplane on June 28. The water table treatments were imposed on the day of planting and maintained until day 146, one day before corn harvest. Sampling of runoff went from day 0 to day 197; sampling of drain line effluent continued through day 328. Tillage treatments were the same for all plots.								

Crop 1 Corn Yield -999999 NA

Study ID	**201300547304**	**Study Area**	**CWT75**	Area (ha)	0.21	Tillage	Not specified	Cover Crop	None
Practice ID	436	Practice Name	CWT75	General Practice	Drainage Water Management			Area Type	T
Category	Management	Study Focus	Controlled Drainage	Practice Overview	NM-CCN-CT-CO-ED				
Irrigation	Yes	Irrig. Descrip.							
Soils	Commerce silt loam (Aeric Fluvaquent)								
Fertilizer	A "starter" application of ammonium nitrate was applied at 56 kg N/ha on April 19 and was tilled into the top 7.5 to 10 cm of soil. A side-dress N application (84 kg N/ha) was made on May 17. On June 28 a third application (84 kg N/ha) was applied by aircraft; no tillage occurred.								
Comments	This study was conducted on 16 0.21-ha plots. Three subsurface drains were installed 1.2 m below the soil surface. Field instrumentation included microprocessor-controlled water table management (drainage and/or sub irrigation), and automated measuring and sampling of runoff and drain line effluent. A starter nitrogen application at 56 kg/ha was tilled into the surface on April 19. Corn was planted on April 27. A sidedress of 84 kg N/ha was applied on May 17th and a third application of 84 kg N/ha was applied by airplane on June 28. The water table treatments were imposed on the day of planting and maintained until day 146, one day before corn harvest. Sampling of runoff went from day 0 to day 197; sampling of drain line effluent continued through day 328. Tillage treatments were the same for all plots.								

Crop	1	Corn	Yield	-999999	NA

Test Site ID	Test Site Name
2013007005	**Wood et al. 1999**

Location	Belle Mina	Limestone	AL	US
Study Citation	1999			
	Wood, B.H., C.W. Wood, K.H. Yoo, K.S. Yoon, and D.P. Delaney.			
	Seasonal Surface Runoff Losses of Nutrients and Metals from Soils Fertilized with Broiler Litter and Commercial Fertilizer			
	J. Environ. Qual. 28: 1210-1218			
NRCS LRR	East and Central Farming and Forest Region			
NRCS MLRA	Springfield Plain			
HUC_10	0603000207	Test Site Scale	Plot	
Experimental Design Type/ Description	Multiple Treatments w/ Control			
	plot study: complete randomized block			
Crops	Corn, rye			
Study Duration	3 years			

Summary

A study was conducted on a 4% slope during 1991 to 1993 at Belle Mina, AL, on a Decatur silty clay to determine effects of broiler litter (BL) on seasonal transport losses of nutrients and heavy metals in surface water. A corn (Zea mays L)-winter rye (Secale cereale L.) cropping system was fertilized with either: (i) 9 Mg BL/ha (BL9), (ii) 18 Mg BL/ha (BL18), or (iii) commercial fertilizer at the recommended rate (CF). Runoff water samples were collected after each runoff producing rainfall event. Litter treatments decreased sediment flow-weighted concentrations during the second corn growing season owing to residual broiler litter. Flow-weighted concentrations of NO3-N and NH4-N were highest under BL18 during the second corn season. Total P and dissolved P flow-weighted concentrations and seasonal transport losses were highest under BL18 during the second corn season. Sediment nutrient flow-weighted concentrations of K, Mg, and Mn were highest under CF during the second corn season. Dissolved nutrient flow-weighted concentrations of Ca, K, and Mg were highest under BL18 during the second corn season. Nutrient flow-weighted concentrations, except Ca, from all treatments provide adequate levels to support algae growth.

Study ID	**201300700501**	**Study Area**	**CF**	Area (ha)	0.10	Tillage	No Till	Cover Crop	Winter Rye
Practice ID	1	Practice Name	Commercial Conv	General Practice		Control		Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview		NC-CCY-NT-CO-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Silty Clay- Decatur								
Fertilizer	Broiler litter and commercial fertilizer treatments were applied with a commercial pull type spreader and were disked into the soil immediately after application on March 27, 1991. No adjustments to commercial fertilizer rate. Application rate for N and P were 157 kg N/ha (450 kg ammonium nitrate/ha) and 50 kg P2)5/ha (112 triple super phosphate/ha).								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn	Yield	-999999	NA
Crop	2	Winter Rye Cover Crop	Yield	-999999	NA
Crop	3	Corn	Yield	-999999	NA
Crop	4	Winter Rye Cover Crop	Yield	-999999	NA

Study ID	**201300700502**	**Study Area**	**BL9**	Area (ha)	0.10	Tillage	No Till	Cover Crop	Winter Rye
Practice ID	2	Practice Name	Broiler Litter (9) Conv	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCY-NT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silty Clay- Decatur								
Fertilizer	Broiler litter and commercial fertilizer treatments were applied with a commercial pull type spreader and were disked into the soil immediately after application on March 27, 1991.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn	Yield	-999999	NA
Crop	2	Winter Rye Cover Crop	Yield	-999999	NA
Crop	3	Corn	Yield	-999999	NA
Crop	4	Winter Rye Cover Crop	Yield	-999999	NA

Study ID	**201300700503**	**Study Area**	**BL18**	Area (ha)	0.10	Tillage	No Till	Cover Crop	Winter Rye
Practice ID	3	Practice Name	Broiler Litter (18) Conv	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCY-NT-CO-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Silty Clay- Decatur								
Fertilizer	Broiler litter and commercial fertilizer treatments were applied with a commercial pull type spreader and were disked into the soil immediately after application on March 27, 1991.								
Comments	Imported from MANAGE 2013; additional meta data added in 2015.								

Crop	1	Corn	Yield	-999999	NA
Crop	2	Winter Rye Cover Crop	Yield	-999999	NA
Crop	3	Corn	Yield	-999999	NA
Crop	4	Winter Rye Cover Crop	Yield	-999999	NA

Test Site ID	Test Site Name
2013007042	**Wortmann et al. 2006**
Location	Lincoln, Lancaster, NE, US
Study Citation	2006 Wortmann, C.S., and D.T. Walters. Phosphorus Runoff during Four Years following Composted Manure Application J. Environ. Qual. 35:651-657
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Nebraska and Kansas Loess-Drift Hills
HUC_10	1020020308
Test Site Scale	Plot
Experimental Design Type/ Description	Multiple Treatments w/ Control and Replication Randomized Complete Block with Replication. Research was conducted to evaluate soil P tests in prediction of P concentration in runoff and to determine the residual effects of composted manure on runoff P loss and leaching of P. The research was conducted from 2001 to 2004 under natural runoff events with plots of 11-m length.
Crops	Corn, Soybeans
Study Duration	3 years

Summary

Repeated manure application can lead to excessive soil test P (STP) levels and increased P concentration in runoff, but also to improved water infiltration and reduced runoff. Research was conducted to evaluate soil P tests in prediction of P concentration in runoff and to determine the residual effects of composted manure on runoff P loss and leaching of P. The research was conducted from 2001 to 2004 under natural runoff events with plots of 11-m length. Low-P and high- p compost had been applied during the previous 3 yr, resulting in total applications of 750 and 1150 kg P / ha. Bray-Pl in the surface 5 cm of soil was increased from 16 to 780 mg/kg with application of high-P compost. Runoff and sediment losses were 69 and 120% greater with no compost than with residual compost treatments. Runoff P concentration increased as STP increased, but much P Joss occurred with the no-compost treatment as well. Agronomic soil tests were predictive of mean runoff P concentration, but increases in STP resulted in relatively small increases in runoff P concentration. Downward movement of P was not detected below 0.3 m. In conclusion, agronomic soil tests are useful in predicting long-term runoff P concentration, and risk of P loss may be of concern even at moderate soil P levels. The residual effect of compost application in reducing sediment and runoff loss was evident more than 3 yr after application and should be considered in P indices.

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300704201**	**Study Area**	**High-P compost**	Area (ha)	0.03	Tillage	Disked	Cover Crop	None
Practice ID	1	Practice Name	High-P compost	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NC-CCN-CT-CS-EN				
Irrigation	Yes	Irrig. Descrip.	Irrigation water was supplied during the growing season when available water holding capacity reached 50% depletion. All runoff events occurred from March through August and were associated with rainfall or snowmelt events, except for one event in July 2002, which was induced with excessive irrigation.						
Soils	Fine-silty, mixed, mesic Typic Eutrochrept; texture 28% sand, 58% silt, and 14% clay								
Fertilizer	Low P (0.20-0.36% P) and high P (0.36-0.46% P) composted feedlot manure applied annually to 6 compost treatments in each replication for 3 yr before the 2001 crop season. The P levels were achieved by feeding beef cattle rations of low (0.24-0.28%) and high (0.35-0.45%) P content. Low-P and high-P composts were each applied in 3 management treatments: winter surface application; spring pre-plant application incorporated by disking; and spring postplant surface application with no incorporation. A replicated control was included as the 7th treatment, consisting of 200 kg N ha- 1 applied to corn as NH4N03 broadcast before incorporation with spring tillage. During the course of 3 yr, a total of 750 and 1150 kg ha- 1 of P was applied with the low-P and high-P compost, respectively. The last compost applications were in the spring of 2000 except for the winter-applied treatments, where application was made in January of 2001. Plots receiving this last winter application in 2001 were excluded from the analysis of 2001 data, as this study addressed residual effects of manure application.								
Comments	Study objective was to determine the residual effects of low and high-P composted beef cattle feedlot manure on STP levels, P losses in runoff and sediment, leaching of P, and crop yield. No fertilizer was applied during the study period itself.								

Crop	1	Soybean	Yield	4.07	Mg/ha
Crop	2	Corn	Yield	11.42	Mg/ha
Crop	3	Soybean	Yield	3.59	Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201300704202**	**Study Area**	**Low-P compost**	Area (ha)	0.03	Tillage	Disked	Cover Crop	None
Practice ID	2	Practice Name	Low-P compost	General Practice	Nutrient Management			Area Type	T
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-CT-CS-EN				
Irrigation	Yes	Irrig. Descrip.	Irrigation water was supplied during the growing season when available water holding capacity reached 50% depletion. All runoff events occurred from March through August and were associated with rainfall or snowmelt events, except for one event in July 2002, which was induced with excessive irrigation.						
Soils	Fine-silty, mixed, mesic Typic Eutrochrept; texture 28% sand, 58% silt, and 14% clay								
Fertilizer	Low P (0.20-0.36% P) and high P (0.36-0.46% P) composted feedlot manure applied annually to 6 compost treatments in each replication for 3 yr before the 2001 crop season. The P levels were achieved by feeding beef cattle rations of low (0.24-0.28%) and high (0.35-0.45%) P content. Low-P and high-P composts were each applied in 3 management treatments: winter surface application; spring pre-plant application incorporated by disking; and spring postplant surface application with no incorporation. A replicated control was included as the 7th treatment, consisting of 200 kg N ha- 1 applied to corn as NH4N03 broadcast before incorporation with spring tillage. During the course of 3 yr, a total of 750 and 1150 kg ha- 1 of P was applied with the low-P and high-P compost, respectively. The last compost applications were in the spring of 2000 except for the winter-applied treatments, where application was made in January of 2001. Plots receiving this last winter application in 2001 were excluded from the analysis of 2001 data, as this study addressed residual effects of manure application.								
Comments	Study objective was to determine the residual effects of low and high-P composted beef cattle feedlot manure on STP levels, P losses in runoff and sediment, leaching of P, and crop yield. No fertilizer was applied during the study period itself.								

Crop	1	Soybean	Yield	4.27	Mg/ha
Crop	2	Corn	Yield	11.22	Mg/ha
Crop	3	Soybean	Yield	3.73	Mg/ha

Study ID	**201300704203**	**Study Area**	**No compost**	Area (ha)	0.03	Tillage	Disked	Cover Crop	None
Practice ID	3	Practice Name	No compost	General Practice	Control			Area Type	C
Category	Management	Study Focus	Fertilizer	Practice Overview	NM-CCN-CT-CS-EN				
Irrigation	Yes	Irrig. Descrip.	Irrigation water was supplied during the growing season when available water holding capacity reached 50% depletion. All runoff events occurred from March through August and were associated with rainfall or snowmelt events, except for one event in July 2002, which was induced with excessive irrigation.						
Soils	Fine-silty, mixed, mesic Typic Eutrochrept; texture 28% sand, 58% silt, and 14% clay								
Fertilizer	This study area is the replicated control (the 7th treatment), consisting of 200 kg N ha- 1 applied to corn as NH4N03 broadcast before incorporation with spring tillage.								
Comments	Study objective was to determine the residual effects of low and high-P composted beef cattle feedlot manure on STP levels, P losses in runoff and sediment, leaching of P, and crop yield. No fertilizer was applied during the study period itself.								

Crop	1	Soybean	Yield	3.84	Mg/ha
Crop	2	Corn	Yield	11.08	Mg/ha

Crop	3	Soybean	Yield	3.3 Mg/ha

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Test Site ID	Test Site Name
2016002002	**Zeimen 2006 1 Franklin**

Location		Franklin	KS	US

Study Citation	2006
	Zeimen, M. B., Janssen, K. A., Sweeney, D. W., Pierzynski, G. M., Mankin, K. R., Devlin, D. L., Regehr, D. L.,Langemeier, M. R., and McVay, K. A.
	Combining management practices to reduce sediment, nutrients, and herbicides in runoff
	Journal of Soil and Water Conservation
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Cherokee Prairies
HUC_10	10290101
Test Site Scale	Plot
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)
	All treatments were replicated, resulting in a total of six plots in a completely randomized design. Only averages of the replicates reported, therefore only 3 study areas shown.
Crops	soybean, sorghum
Study Duration	4 years

Summary

This study tested combinations of tillage and application management practices in order to determine the best combination for simultaneously reducing sediment, nutrient, and herbicide losses with surface water runoff from cropland. Runoff was collected from the Franklin County, Kansas site in sorghum-soybean rotation during the 2001 to 2004 crop years and analyzed for bioavailable phosphorus (P), soluble P, total P, ammonium, nitrate, total nitrogen (N), sediment, atrazine, and metolachlor concentrations. No-till treatments consistently experienced higher runoff water volumes than the chisel/disk tillage system. The no-till treatments had higher nutrient and herbicide losses than chisel/disk tillage regardless of use of high or low application management techniques. Few consistent differences were seen for pollutant loss between the high and standard application management. The chisel/disk low experienced two times higher sediment losses compared with the no-till low or no-till high, when averaging over all eight location-years. However, tolerable soil loss was not exceeded. Chisel/disk low generally had small losses for all tested pollutants and may be the best management combination to simultaneously reduce nutrient, herbicide, and sediment losses with cropland runoff for sites like those used in this study.

Study ID	**201600200201**	**Study Area**	**Franklin Chisel Low**	Area (ha)	-99.00	Tillage	Chisel Disk	Cover Crop	
Practice ID	1	Practice Name	Conventional Till, Conventional Application	General Practice		Conservation Tillage, Fertilizer		Area Type	C
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-CT-SGB-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Eram-Lebo complex (fine, mixed, active, thermic Aquic Argiudolls and Loamy-skeletal, mixed, thermic Typic Hapludolls), with four to five percent slope.								
Fertilizer	Fertilizer broadcast applied then incorporated								
Comments									

Crop	1	Soybean	Yield
Crop	2	Sorghum	Yield

Acknowledgement: Study summaries may be directly quoted from original author's abstract.

Study ID	**201600200202**	**Study Area**	**Franklin No Till Low**	Area (ha) -99.00	Tillage	No-Till	Cover Crop
Practice ID	2	Practice Name	No-Till, Conventional Application	General Practice	Conservation Tillage, Fertilizer		Area Type T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-NT-SGB-EN		
Irrigation	No	Irrig. Descrip.					
Soils	Eram-Lebo complex (fine, mixed, active, thermic Aquic Argiudolls and Loamy-skeletal, mixed, thermic Typic Hapludolls), with four to five percent slope.						
Fertilizer	Fertilizer broadcast applied without incorporation						
Comments							

Crop	3	Soybean	Yield
Crop	4	Sorghum	Yield

Study ID	**201600200203**	**Study Area**	**Franklin No Till High**	Area (ha) -99.00	Tillage	No-Till	Cover Crop
Practice ID	3	Practice Name	No-Till, Managed Application	General Practice	Conservation Tillage, Fertilizer		Area Type T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-NT-SGB-EN		
Irrigation	No	Irrig. Descrip.					
Soils	Eram-Lebo complex (fine, mixed, active, thermic Aquic Argiudolls and Loamy-skeletal, mixed, thermic Typic Hapludolls), with four to five percent slope.						
Fertilizer	Fertilizer knife applied						
Comments							

Crop	5	Soybean	Yield
Crop	6	Sorghum	Yield

Test Site ID	Test Site Name
2016002003	**Zeimen 2006 2 Crawford**

Location		Crawford	KS	US

Study Citation	2006
	Zeimen, M. B., Janssen, K. A., Sweeney, D. W., Pierzynski, G. M., Mankin, K. R., Devlin, D. L., Regehr, D. L.,Langemeier, M. R., and McVay, K. A.
	Combining management practices to reduce sediment, nutrients, and herbicides in runoff
	Journal of Soil and Water Conservation
NRCS LRR	Central Feed Grains and Livestock Region
NRCS MLRA	Cherokee Prairies
HUC_10	11070205
Test Site Scale	Plot
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)
	Randomized complete block, with repliction. Each tillage/management combination was replicated, for a total of eight plots in a randomized complete block.
Crops	soybean, sorghum
Study Duration	4 years

Summary

This study tested combinations of tillage and application management practices in order to determine the best combination for simultaneously reducing sediment, nutrient, and herbicide losses with surface water runoff from cropland. Runoff was collected from the Crawford County, Kansas site in sorghum-soybean rotation during the 2001 to 2004 crop years and analyzed for bioavailable phosphorus (P), soluble P, total P, ammonium, nitrate, total nitrogen (N), sediment, atrazine, and metolachlor concentrations. No-till treatments consistently experienced higher runoff water volumes than the chisel/disk tillage system. The no-till treatments had higher nutrient and herbicide losses than chisel/disk tillage regardless of use of high or low application management techniques. Few consistent differences were seen for pollutant loss between the high and standard application management. The chisel/disk low experienced two times higher sediment losses compared with the no-till low or no-till high, when averaging over all eight location-years. However, tolerable soil loss was not exceeded. Chisel/disk low generally had small losses for all tested pollutants and may be the best management combination to simultaneously reduce nutrient, herbicide, and sediment losses with cropland runoff for sites like those used in this study.

Study ID	**201600200301**	**Study Area**	**Crawford Chisel Low**	Area (ha)	0.40	Tillage	Chisel Disk	Cover Crop	
Practice ID	1	Practice Name	Conventional Till, Conventional Application	General Practice		Conservation Tillage, Fertilizer		Area Type	C
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-CT-SGB-EN			
Irrigation	No	Irrig. Descrip.							
Soils	Parsons silt loam (fine, mixed, active, thermic Mollic Albaqualfs) with less than two percent slope. This site has a claypan.								
Fertilizer	Fertilizer broadcast applied then incorporated								
Comments									

Crop	1	Sorghum	Yield
Crop	2	Soybean	Yield

Study ID	**201600200302**	**Study Area**	**Crawford Chisel High**	Area (ha)	0.40	Tillage	Chisel Disk	Cover Crop	
Practice ID	2	Practice Name	Conventional Till, Managed Application	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-SGB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Parsons silt loam (fine, mixed, active, thermic Mollic Albaqualfs) with less than two percent slope. This site has a claypan.								
Fertilizer	Fertilizer knife applied								
Comments									

Crop	3	Sorghum	Yield
Crop	4	Soybean	Yield

Study ID	**201600200303**	**Study Area**	**Crawford No Till Low**	Area (ha)	0.40	Tillage	No-Till	Cover Crop	
Practice ID	3	Practice Name	No-Till, Conventional Application	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-NT-SGB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Parsons silt loam (fine, mixed, active, thermic Mollic Albaqualfs) with less than two percent slope. This site has a claypan.								
Fertilizer	Fertilizer broadcast applied without incorporation								
Comments									

Crop	5	Sorghum	Yield
Crop	6	Soybean	Yield

Study ID	**201600200304**	**Study Area**	**Crawford No Till High**	Area (ha)	0.40	Tillage	No-Till	Cover Crop	
Practice ID	4	Practice Name	No-Till, Managed Application	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-NT-SGB-EN				
Irrigation	No	Irrig. Descrip.							
Soils	Parsons silt loam (fine, mixed, active, thermic Mollic Albaqualfs) with less than two percent slope. This site has a claypan.								
Fertilizer	Fertilizer knife applied								
Comments									

Crop	7	Sorghum	Yield
Crop	8	Soybean	Yield

Test Site ID	Test Site Name
2016002010	**Zhao et al., 2001**

Location		Redwood	MN	US
Study Citation	2001			
	Zhao, S. L., Gupta, S. C., Huggins, D. R., Moncrief, J. F.			
	Tillage and Nutrient Source Effects on Surface and Subsurface Water Quality at Corn Planting			
	Journal of Environmental Quality			
NRCS LRR	Central Feed Grains and Livestock Region			
NRCS MLRA	Central Iowa and Minnesota Till Prairies			
HUC_10	0702000804	Test Site Scale	Plot	
Experimental Design Type/ Description	Paired Sites (Multiple Tests, No Control)			
	randomized split-plot design with four replications			
Crops	Corn (simulated planting)			
Study Duration	5 days			

Summary

This study quantified the effects of tillage (moldboard plowing [MP], ridge tillage [RT]) and nutrient source (manure and commercial fertilizer [urea and triple superphosphate]) on sediment, NH4+-N, NO3- -N, total P, particulate P, and soluble P losses in surface runoff and subsurface tile drainage from a clay loam soil. Treatment effects were evaluated using simulated rainfall immediately after corn (Zea mays L.) planting, the most vulnerable period for soil erosion and water quality degradation. Sediment, total P, soluble P, and NH4+-N losses mainly occurred in surface runoff. The NO3--N losses primarily occurred in subsurface tile drainage. In combined (surface and subsurface) flow, the MP treatment resulted in nearly two times greater sediment loss than RT (P < 0.01). Ridge tillage with urea lost at least 11 times more NH4+-N than any other treatment (P < 0.01). Ridge tillage with manure also had the most total and soluble P losses of all treatments (P < 0.01). Tillage systems that do not incorporate surface residue and amendments appear to be more vulnerable to soluble nutrient losses mainly in surface runoff but also in subsurface drainage (due to macropore flow). Tillage systems that thoroughly mix residue and amendments in surface soil appear to be more prone to sediment and sediment-associated nutrient (particulate P) losses via surface runoff.

Study ID	**201600201001**	**Study Area**	**Moldboard Plow - Manure**	Area (ha)	0.07	Tillage	Conventional (Moldboard Plow)	Cover Crop	None
Practice ID	1	Practice Name	Moldboard Plow - Manure	General Practice		Conservation Tillage, Fertilizer		Area Type	C
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview		NC-CCN-CN-CO-EN			
Irrigation	Unknown	Irrig. Descrip.							
Soils	Webster clay loam (fine-loamy, mixed, mesic Typic Haplaquoll)								
Fertilizer	Manure broadcast applied in the fall and incorporated to 20 cm depth with moldboard plowing. Rates based on soil testing. Estimated applied available N and P was 157 kg N/ha and 196 kg P2O5/ha in Fall 1996.								
Comments	Fall moldboard plowing followed by two passes of field cultivation, Fall broadcast applied beef manure.								

Crop 1 Corn (simulated planting, no seed) Yield

Study ID	**201600201002**	**Study Area**	**Moldboard Plow - Urea**	Area (ha)	0.07	Tillage	Conventional (Moldboard Plow)	Cover Crop	None
Practice ID	2	Practice Name	Moldboard Plow - Urea	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CN-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Webster clay loam (fine-loamy, mixed, mesic Typic Haplaquoll)								
Fertilizer	Urea surface broadcast in the Spring just before planting and incorporated to 5 cm depth with two passes of field cultivation. Rates based on soil testing, 157 kg N/ha applied in Spring 1997.								
Comments	Fall moldboard plowing followed by two passes of field cultivation, Spring surface broadcast urea.								

Crop 2 Corn (simulated planting, no seed) Yield

Study ID	**201600201003**	**Study Area**	**Ridge Till - Manure**	Area (ha)	0.07	Tillage	Ridge Tillage	Cover Crop	None
Practice ID	3	Practice Name	Ridge Till - Manure	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NC-CCN-CT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Webster clay loam (fine-loamy, mixed, mesic Typic Haplaquoll)								
Fertilizer	Manure broadcast applied in the fall and remained at surface until ridge establishment in June. Rates based on soil testing. Estimated applied available N and P was 157 kg N/ha and 196 kg P2O5/ha in Fall 1996.								
Comments	Spring ridge tillage with ridges running parallel to the slope, Fall broadcast applied beef manure.								

Crop 3 Corn (simulated planting, no seed) Yield

Study ID	**201600201004**	**Study Area**	**Ridge Till - Urea**	Area (ha)	0.07	Tillage	Ridge Tillage	Cover Crop	None
Practice ID	4	Practice Name	Ridge Till - Urea	General Practice	Conservation Tillage, Fertilizer			Area Type	T
Category	Management	Study Focus	Tillage, Fertilizer	Practice Overview	NM-CCN-CT-CO-EN				
Irrigation	Unknown	Irrig. Descrip.							
Soils	Webster clay loam (fine-loamy, mixed, mesic Typic Haplaquoll)								
Fertilizer	Urea surface broadcast in the Spring, remained at surface until ridge establishment in June. Rates based on soil testing, 157 kg N/ha applied in Spring 1997.								
Comments	Spring ridge tillage with ridges running parallel to the slope, Spring surface broadcast urea.								

Crop 4 Corn (simulated planting, no seed) Yield