

# Blind Inlets: A Conservation Practice to Reduce Pesticide Loadings from Small Depressions in Fields

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## Introduction:

### CEAP: Conservation Effects Assessment Project

- Multi-agency
- BMP effectiveness measured
- New science based BMP's
- High sediment and nutrient load mitigation studies

### The Blind Inlet (BI)

- Tile riser replacement
- Filter
- Moderates/reduces discharge

**Objective:** To assess the BI's suitability as a conservation practice to reduce pesticide losses, compared to the tile riser

## Research Site Description

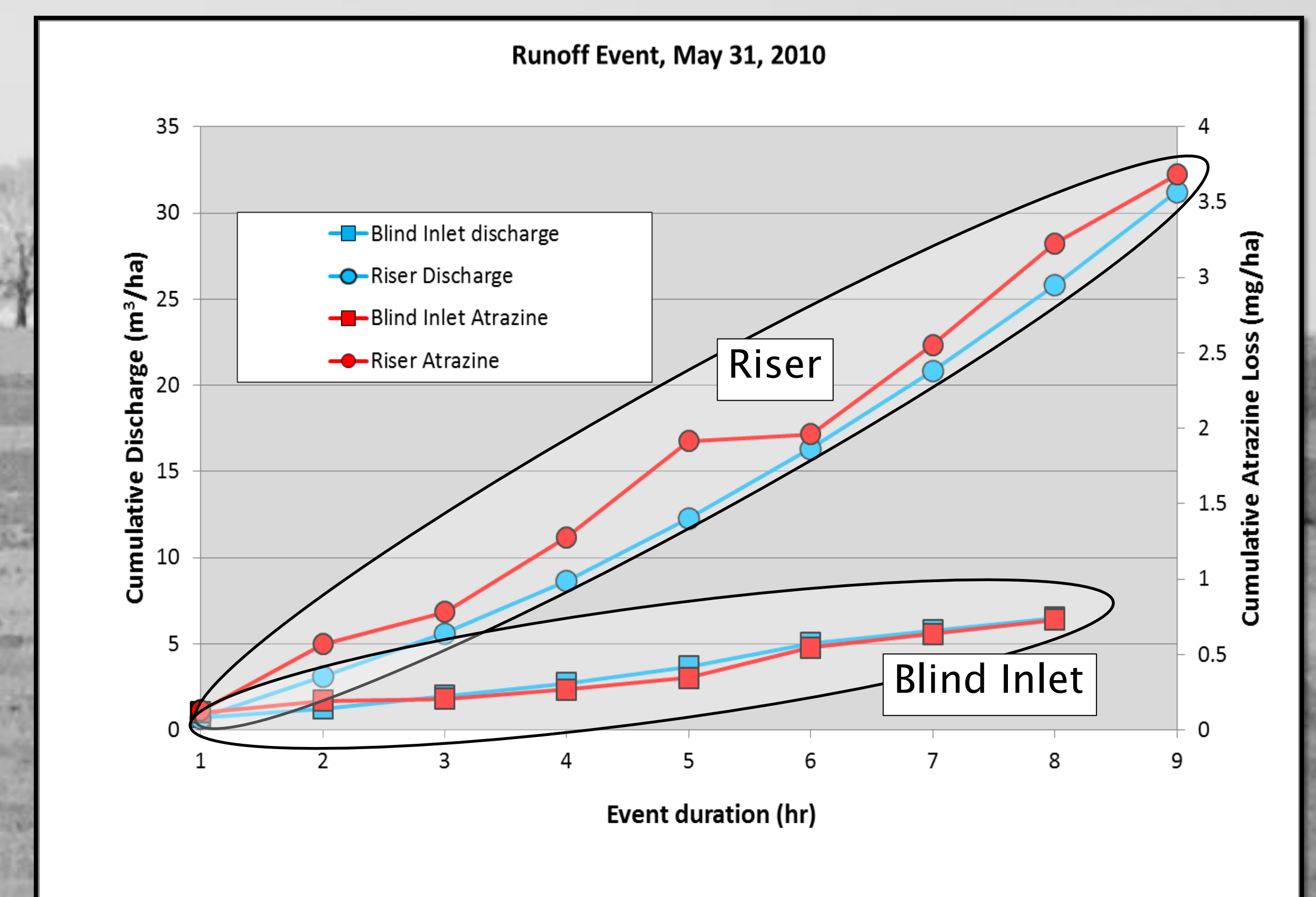
Paired closed depressions dominated by clay loam, silty clay loam, and silt loam soils, 0–3% slope.

## Sample Analysis

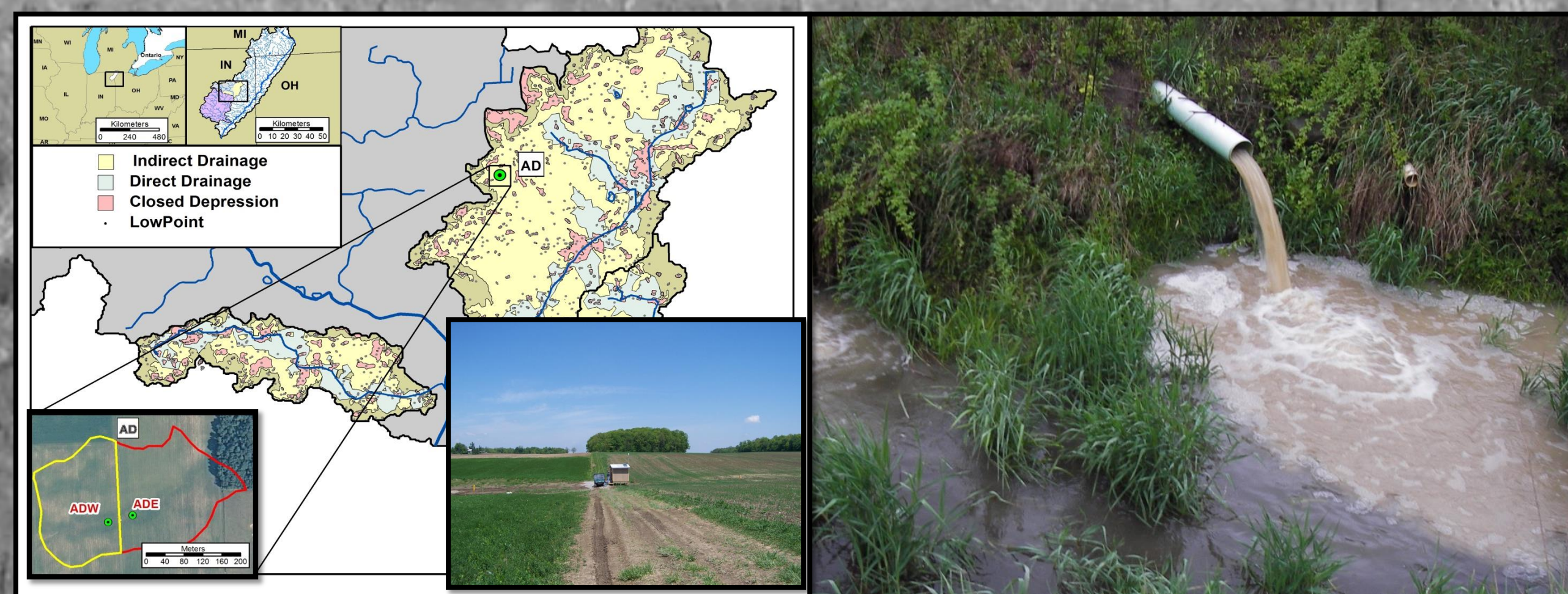
Samples were analyzed for pesticides using chromatographic techniques



Blind inlet after 10 years, corn-bean, no-till

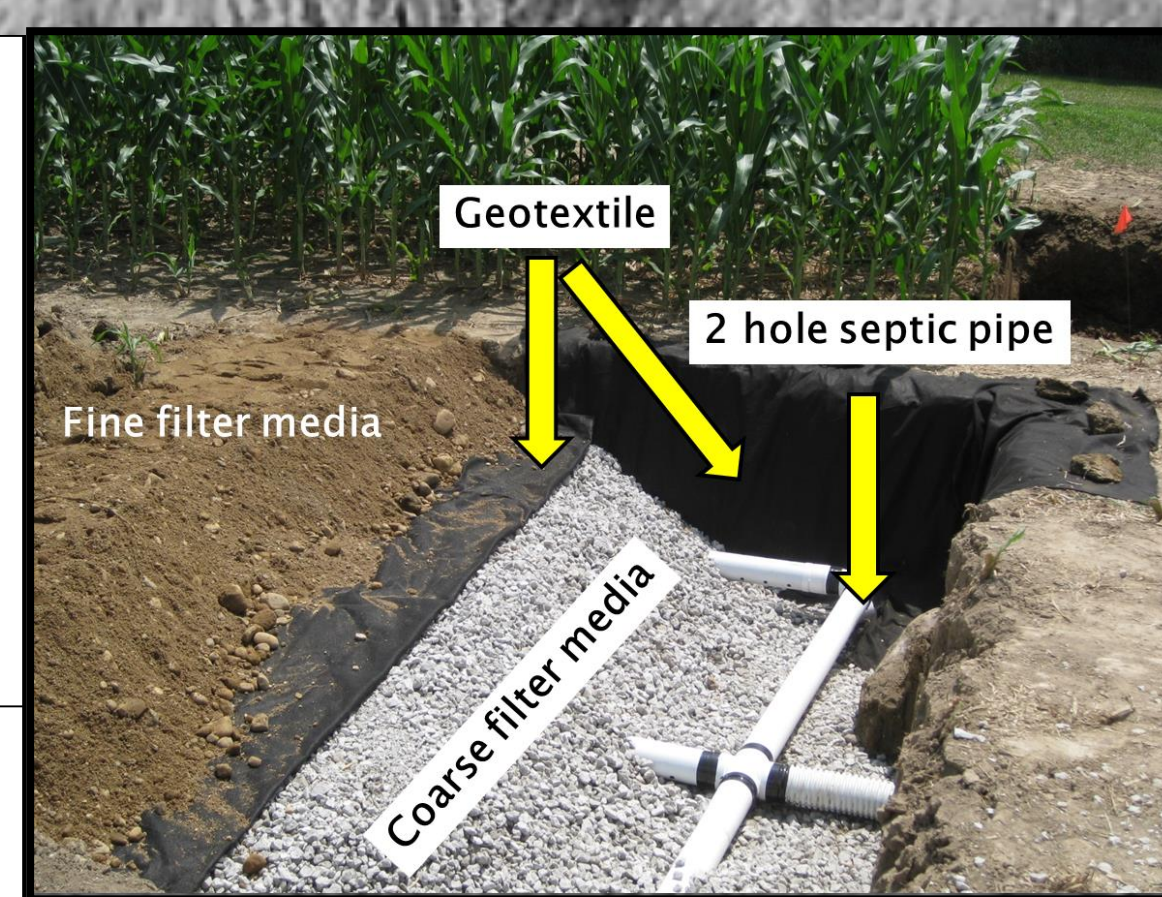
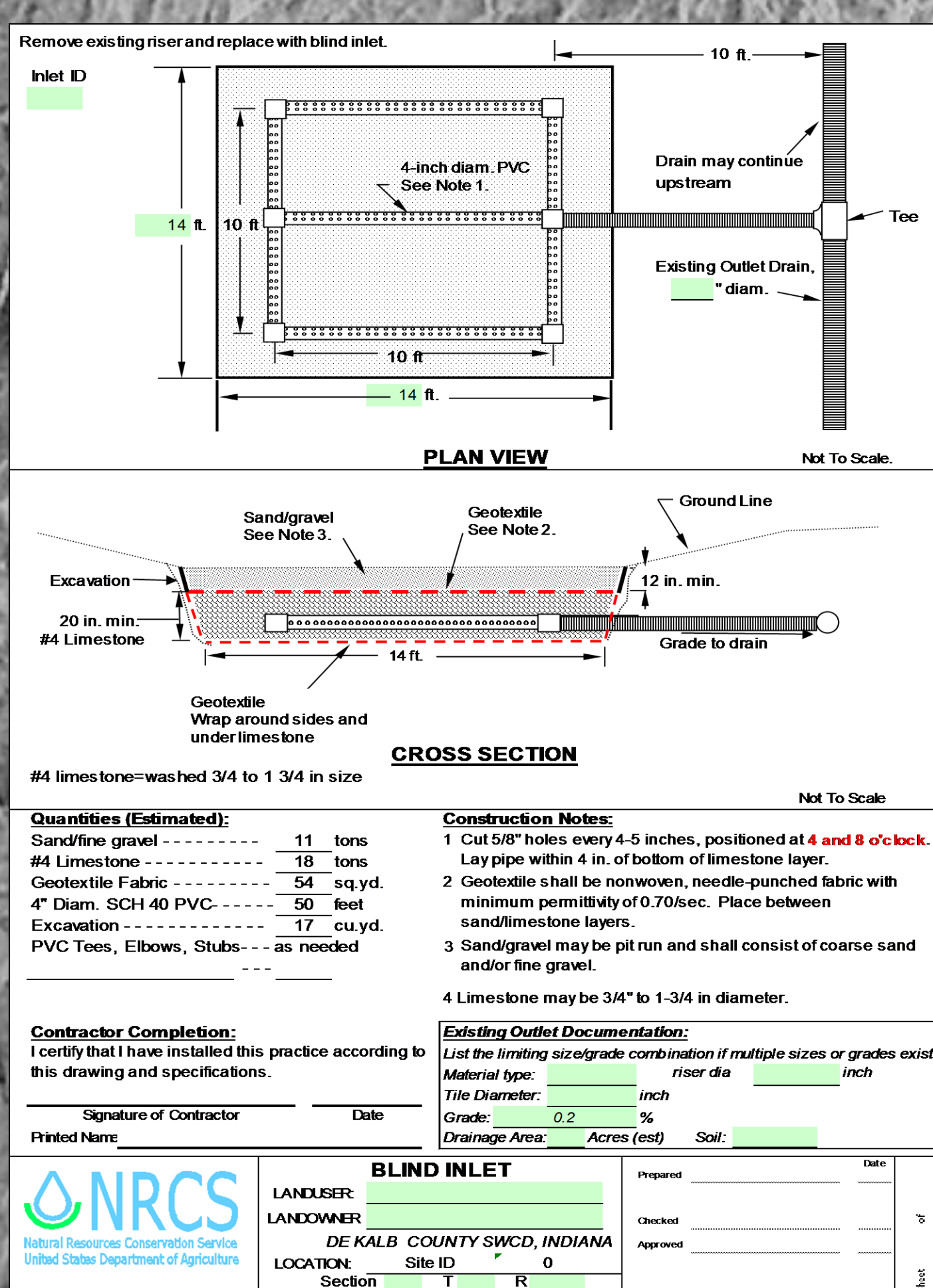


Cumulative Atrazine loss, May 31, 2010



Location: NE Indiana, Western Lake Erie Basin

Discharge from tile riser inlet



Blind inlet cross-section



Auto-samplers for water quality

## Management history from 2008–2013

Year	Crop	Drainage condition			Pesticide application		
		Date Open	ADE	ADW	Name	Date Applied	Rate (g ha <sup>-1</sup> )
2008	Corn	Apr 1	Blind Inlet	Tile Riser	Metolachlor	May 9	1346
					Atrazine	May 9	1739
2009	Soybean	Mar 31	Tile Riser	Blind Inlet	Glyphosate	May 3	833
		Jun 19	Blind Inlet	Tile Riser			
2010	Oat	Jan 1	Blind Inlet	Tile Riser	2,4-D	May 26	533
		Sep 24	Tile Riser	Blind Inlet			
2011	Wheat	Jan 1	Tile Riser	Blind Inlet			
			Tile Riser	Blind Inlet			
2012	Corn	Apr 3	Blind Inlet	Tile Riser	Metolachlor	Apr 24	1346
			Blind Inlet	Tile Riser	Atrazine	Apr 24	1739
2013	Soybean	Jan 1	Blind Inlet	Tile Riser	Glyphosate	Jun 20	833
		May 1	Tile Riser	Blind Inlet			

- 20 runoff events
- 1.95–12.5cm precipitation / event
- Surface discharge reduced by 45%
- Atrazine loss reduced by 69%
- DEA loss reduced by 57%
- 2,4-D loss reduced by 58%
- Metolachlor loss reduced by 53%
- Glyphosate loss reduced by 11%

## Discharge and pesticides reduction by the blind inlet vs. tile riser

Runoff Event	Discharge	Atrazine	Glyphosate	2,4-D	Metolachlor	DEA <sup>1</sup>	Sum Herbicides <sup>2</sup>
2008	91%	52%	na <sup>3</sup>	nd <sup>4</sup>	30%	nd	31%
2009	55%	na	na	nd	53%	nd	44%
2010	65%	82%	72%	58%	80%	82%	63%
2011	1%	7%	-39%	-53%	-58%	-18%	-25%
2012	No Discharge	na	na	na	na	na	na
2013	56%	65%	4%	81%	63%	65%	65%
<b>Total<sup>5</sup></b>	<b>45%</b>	<b>69%</b>	<b>11%</b>	<b>58%</b>	<b>53%</b>	<b>57%</b>	<b>58%</b>

<sup>1</sup> DEA = Deethylatrazine, <sup>2</sup> Sum of atrazine, 2,4-D, metolachlor, and deethylatrazine, <sup>3</sup> No atrazine loss observed from the tile riser in 2010, <sup>4</sup> 2,4-D and DEA not analyzed in 2008–09, <sup>5</sup> Sum of years 2008–2013

## Conclusions

- This is the first study to examine the effectiveness of blind inlets as a conservation practice in mitigating pesticide loadings from this vulnerable landscape position.
- Blind inlets can reduce pesticide losses when compared to tile risers, similar results have previously been presented regarding nutrient losses.
- Blind inlets have a useful life time that exceeds 10 years under proper conditions.
- This information can be used by policy makers and agricultural producers in determining conservation planning where pesticide loadings to downstream water are a primary resource concern.

## Acknowledgments

- Producers in the watershed
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- Technicians involved in installation, sample collection/analysis
- NRCS, TNC, countless others

