2019 Advanced Conservation Drainage Training

Economics of Nutrient Loss Reduction

Saturated Buffer Edition!

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Objective:

Practical tips for discussing the cost of this practice to landowners

Understand general components, cost of each

Dreamboard:

Nutrient reduction practices are considered part of the tile system costs themselves. Cost of doing business

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Pattern Tile Costs, ROI

- Cost is typically seen as an upfront investment that will more than return its value due to increased yield & increased land value
- Very average numbers:
  - $1,000/acre to install pattern tile
  - 12-54 bu/ac for corn
  - 5-18 bu/ac for soy

Depends on soil type

- Payback in 3-10 years

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Keep this in mind…we'll revisit ☺

Saturated Buffer: Components

Water Control Structure (2 or 3 chamber)	$800-$2,000
PVC Pipe and Fittings (around WCS)	$400
Lateral Tile (4”) + installation with tiling machine	$1-3/foot
Backhoe (~4 hours)	$400
Mobilization (if retrofit)	$250-500
Practice Design (if retrofit)	$2,000

Varies widely site-by-site

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Table 3.11. Example statewide results for nitrate-nitrogen reductions, with shading to represent in-field, edge-of-field, land use, and point source practices or scenarios.

Practice/scenario	Nitrate-N reduction per acre (percent)	Nitrate-N reduced (million lb)	Nitrate-N reduction from baseline (percent)	Cost ($/lb removed)
Reducing N rate from background to MRTN on 10 percent of acres	10	2.3	0.6	-4.25
Nitrification inhibitor with all fall-applied fertilizer on tile-drained corn acres	10	4.3	1	2.33
Split application of 50 percent fall and 50 percent spring on tile-drained corn acres	7.5-10	13	3.1	6.22
Spring-only application on tile-drained corn acres	15-20	26	6.4	3.17
Split application of 40 percent fall, 10 percent pre-plant, and 50 percent side dress	15-20	26	6.4	
Cover crops on all corn/soybean tile-drained acres	30	84	20.5	3.21
Cover crops on all corn/soybean non-tiled acres	30	33	7.9	11.02

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NLRS, 2015

Practice/scenario	Nitrate-N reduction per acre (percent)	Nitrate-N reduced (million lb)	Nitrate-N reduction from baseline (percent)	Cost ($/lb removed)
Bioreactors on 50 percent of tile-drained land	25	35	8.5	2.21
Wetlands on 35 percent of tile-drained land	50	49	11.9	4.05
Buffers on all applicable crop land (reduction only for water that interacts with active area)	90	36	8.7	1.63
Perennial/energy crops equal to pasture/hay acreage from 1987	90	10	2.6	9.34
Perennial/energy crops on 10 percent of tile-drained land	90	25	6.1	3.18
Point source reduction to 10 mg/L		14	3.4	3.3

Saturated Buffers *$1.22*

Illinois Nutrient Loss Reduction Strategy

3-36

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Pattern Tile Cost

…with a Saturated Buffer!

Cost to install pattern tile: $1,000/ac

Cost to install saturated buffer that treats 46 acres: $141/ac

$3,736 (installation + materials) + $2,750 design = $6486 / 46 acres = $141/ac

Cost Per Acre/Year over 30-year loan at 5%:

Just Pattern Tile System *vs.* *Tile with Saturated Buffer*

$247 *$282*

If estimated bushel increases are 20 bu/ac corn and 7 bu/ac soy, payback (if paid up front) will occur in:

12 years *vs.* *14 years*

In some cases, Saturated Buffers can moonlight as DWM as well. This cost analysis does NOT figure in the potential yield increase due to holding water back in times of drought/water stress.

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Section 176/Asset depreciation changes make this even sweeter

Pattern Tile Cost

…with cost share and a Saturated Buffer!

Cost to install pattern tile: $1,000/ac
Cost to install saturated buffer that treats 46 acres: $20/ac
$934 (25% of installation + materials due to 75% EQIP) + $0 design = $934 / 46 acres = $20/ac

Cost Per Acre/Year over 30-year loan at 5%:

Just Pattern Tile System *vs.* *Tile with Saturated Buffer*

$247 *$252*

In some cases, Saturated Buffers can moonlight as DWM as well. This cost analysis does NOT figure in the potential yield increase due to holding water back in times of drought/water stress.

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Section 176/Asset depreciation changes make this even sweeter

Cost-Share

Program	Agency	Area
DWM Implementation – EQIP	NRCS	Statewide
NWQI – EQIP	NRCS	Lake Bloomington, Blue Mound, Lake De Revey, Painter Creek, Lake Vermillion, Crooked Creek, Douglas Creek
Macon County RCPP-EQIP	NRCS-Macon County SWCD	Waterways of the Upper Sangamon Basin – Macon County
Upper Macoupin Creek RCPP-EQIP	NRCS - AFT	Upper Macoupin Creek – Honey Creek, Hurricane Creek, Dry Fork, Spanish Needle Creek, Coop Branch, Bullard Lake
Shorebird Conservation RCPP-EQIP	NRCS – U. of Illinois	Champaign, Christian, Clark, Coles, Cumberland, Douglas, Edgar, Macon, Moultrie, Piatt, and Vermilion Counties
MRBI	NRCS	Crow Creek West/Clear Creek, Vermilion Headwaters, Clinton Lake
EQIP	NRCS	Statewide
CLEAR	FSA	Statewide
Mackinaw River Drinking Watershed Project	SWCD, TNC, EDF	McLean County- Six Mile Creek/Money Creek

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Practical tips for discussing the cost

Include in new pattern tile systems

Time retrofits with off-season, tile repairs

Tie to sustainability language, benefits

If DWM is possible, lean on that gain

Voluntary BMP adoption staves off regulation

Source water protection

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Questions?

Upcoming trainings:

- Detailed costs of constructed wetlands, Drainage Water Management
- More marketing strategies
- USDA Programs

Discussion: How have you framed the cost of EOF practices?

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