Targeting Conservation Practices Within a Watershed: Lessons Learned from the Pleasant Valley Project

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2005 WBI Recommendation:
Target conservation to fields with highest runoff sediment and nutrient losses

Recommended tools for identifying fields with higher runoff risk

• RUSLE2 Erosion
  Estimates average annual in-field erosion (tons/acre/yr)
• Wisconsin P Index
  Estimates average annual P delivery to surface water
  • (lb/acre/yr)
2006: Paired watershed pilot began

In-stream gages to monitor flow, sediment, phosphorus

Stream monitoring, sediment and P budgeting
Partners: US Geological Survey, University Wisconsin, WI Department of Natural Resources, The Nature Conservancy
Additional funding: USDA-NIFA

Inventory and Assessment
Partners: Dane County Land Conservation Department and Univ. of Wisconsin
Additional funding: The Nature Conservancy

Implementation
Partners: Producers, Dane County Land Conservation Department, NRCS, UW-Extension
Local land conservation staff key to project

- Fields and pastures for 62 landowners inventoried
- 10 farms where selected for project focus based on P delivery risks

Baseline P Index Distribution
P Index Varies with Management

Rotation: 3 years corn silage and 3 years alfalfa
9% slope, silt loam
Soil test P = 70 ppm

Fall chisel in 10,000 gal/acre dairy manure
5 T/a/yr erosion

No till, fall apply 10,000 gal/acre dairy manure
2 T/a/yr erosion

No till, winter apply 7,000 gal/acre dairy manure
2 T/a/yr erosion

Participating Farms Reduced Runoff Phosphorus

Estimated average annual runoff P losses for participating farms,
baseline (2006-2009) and 2013
Stream Banks a Source of Sediments and Nutrients too

30% of sediment from stream banks
70% from croplands and pastures

Targeted Implementation Worked

Farmers responded

Water quality improved
Reduction in stream phosphorus loads in 2013 storms and snowmelt

Becky Carvin at USGS stream water sampling station

37%

$ per pound P and ton soil erosion reduction?

<table>
<thead>
<tr>
<th>Cropland management practice cost-share expenditures per unit reduction in estimated average P delivery and erosion for three farms</th>
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<tbody>
<tr>
<td><strong>P Index</strong></td>
</tr>
<tr>
<td>$ per lb</td>
</tr>
<tr>
<td>Dairy farm</td>
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<tr>
<td>Beef farm</td>
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<td>Cash grain</td>
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Adding in costs of technical assistance and verification would add $5 -10 per pound P
Land use changes on non-targeted farms added to watershed P loads

Estimated P delivery from agricultural land in Pleasant Valley for participating farms cut in half.

Estimated P delivery from all agricultural land in Pleasant Valley cut by 12%.

Farmer Experience

Mark Keller operates a 300 cow dairy along with his brother Tim. Mark took ownership of the nutrient management plan on their farm and learned the SnapPlus program. He used the program to test out various cropping scenarios that reduced erosion and runoff phosphorus losses and that would fit into their current farming operation, including less tillage and adding winter rye to the rotation in some fields.
### Tips for Future Projects

- Bring in farm consultants from the beginning
- Give farmers as much time as possible for making decisions and flexibility in reaching goals
- Plan for plenty of staff. Projects that need to help farmers implement and document on-farm phosphorus or sediment reductions annually can be very labor-intensive

### Tips for Future Projects

**Relationships with farmer are key**

- Bring in farm consultants from the beginning
- Give farmers as much time as possible for making decisions and flexibility in reaching goals for their own *management systems*
- Plan for plenty of staff. Projects that need to help farmers implement and document on-farm phosphorus or sediment reductions annually can be very labor-intensive
Partners, Assistance and Funding

Dane County, Land Conservation Department
Green County Land Conservation Department
University of Wisconsin-Madison
  Biological Systems Engineering
  Soil Science
  Nelson Institute of Environmental Studies
  Agricultural and Applied Economics
  Civil and Environmental Engineering
  Dairy Science and Agronomy
University of Wisconsin-Extension
U.S. Geological Survey
USDA Natural Resource Conservation Service
Wisconsin DNR
Wisconsin Department of Agriculture, Trade, and Consumer Protection
The Nature Conservancy
Landowners and Farmers
Monsanto Corporation
McKnight Foundation
USDA-NIFA award #2009-51130-06049
USGS cooperative program

Partners discuss new stream crossing on the Judd farm. © TNC