On-Farm Conservation and Nutrient Management in Maryland: A 2010 Snapshot

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The 2010 UMD BMP Survey

• Mail survey asking about best management practice use, cost sharing, and nutrient management planning.
• Sent to 1,000 Maryland farm operations with telephone follow-up conducted by Maryland Agricultural Statistics Service.
• Stratified random sample.
• 523 responses.
• Weights based on farm sales used to create a sample that reflects commercial farming in the state.
Best Management Practices (BMPs) Included in the Survey

- Vegetative Cover
- Water Conveyance and Storage
- Cover Crops
- Conservation Tillage/No-till
- Contour Farming
- Strip Cropping
- Retirement of Highly Erodible Land
- Riparian Buffers (Forest and Grass)
- Wetland Restoration
- Stream Fencing, Stream Crossing, Water Trough
- Poultry Manure or Livestock Waste Storage Structure or Lagoon
- Heavy Use Poultry Area Concrete Pad
Most Maryland farmers use at least one BMP
Large operations use more BMPs than small ones

Number of BMPs Used

- 0
- 1
- 2
- 3
- 4
- 5+

1 to 9999
10,000 to 39,999
40,000 to 99,999
100,000 to 249,999
250,000 to 749,999
750,000 +

12/7/2011
Percentages of farmers with crop operations using crop BMPs

- Conservation/No Till
- Cover Crop
- Strip Farming
- Contour Farming
- Retirement of Highly Erodible Land

- 750,000 +
- 250,000 to 749,999
- 100,000 to 249,999
- 40,000 to 99,999
- 10,000 to 39,999
- 1 to 9999
Percentage of farmers with livestock operations using waste management structures

- **Heavy Use Poultry Area Concrete Pads**
- **Poultry Manure or Livestock Waste Storage Structure or Lagoon**

- 250,000 to 749,999
- 100,000 to 249,999
- 40,000 to 99,999
- 10,000 to 39,999
- 1 to 9999

12/7/2011
Percentages of operations adjacent to water bodies using water protection BMPs

- 750,000 +
  - Riparian buffer: Forest or Grass
  - Stream Fencing, Stream Crossing, or Water Troughs
  - Wetland Restoration

- 250,000 to 749,999
- 100,000 to 249,999
- 40,000 to 99,999
- 10,000 to 39,999
- 1 to 9999

12/7/2011
Percentage of operations using water conveyance and vegetative cover.
## Use of cost-sharing for BMP adoption

<table>
<thead>
<tr>
<th>Practice</th>
<th>Percent Using</th>
<th>Not Receiving Cost-Share</th>
<th>Receiving Cost-Share</th>
<th>Ratio Not Receiving to Receiving Cost-Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetative Cover</td>
<td>21%</td>
<td>17%</td>
<td>4%</td>
<td>4.3 : 1</td>
</tr>
<tr>
<td>Water Conveyance and Storage</td>
<td>20%</td>
<td>12%</td>
<td>7%</td>
<td>1.7 : 1</td>
</tr>
<tr>
<td>Cover Crop</td>
<td>24%</td>
<td>12%</td>
<td>12%</td>
<td>1 : 1</td>
</tr>
<tr>
<td>Conservation/No Till</td>
<td>42%</td>
<td>38%</td>
<td>4%</td>
<td>10 : 1</td>
</tr>
<tr>
<td>Contour Farming</td>
<td>9%</td>
<td>9%</td>
<td>1%</td>
<td>12.8 : 1</td>
</tr>
<tr>
<td>Strip Farming</td>
<td>13%</td>
<td>12%</td>
<td>0%</td>
<td>25.5 : 1</td>
</tr>
<tr>
<td>Retirement of Highly Erodible Land</td>
<td>7%</td>
<td>6%</td>
<td>1%</td>
<td>5.5 : 1</td>
</tr>
<tr>
<td>Forest or Grass Riparian Buffer</td>
<td>33%</td>
<td>22%</td>
<td>10%</td>
<td>2.2 : 1</td>
</tr>
<tr>
<td>Wetland Restoration</td>
<td>7%</td>
<td>4%</td>
<td>3%</td>
<td>1.2 : 1</td>
</tr>
<tr>
<td>Stream Fencing, Stream Crossing, or Water Troughs</td>
<td>34%</td>
<td>19%</td>
<td>14%</td>
<td>1.4 : 1</td>
</tr>
<tr>
<td>Poultry Manure or Livestock Waste Storage Structure or Lagoon</td>
<td>19%</td>
<td>9%</td>
<td>9%</td>
<td>1 : 1</td>
</tr>
<tr>
<td>Heavy Use Poultry Area Concrete Pads</td>
<td>37%</td>
<td>19%</td>
<td>18%</td>
<td>1 : 1</td>
</tr>
</tbody>
</table>
Receipt of cost sharing was more common in large operations using larger numbers of BMPs.

\[ y = 0.057x \]
Do you have a nutrient management plan?

- Yes: 63.1%
- No: 36.9%

12/7/2011
NMP non-compliance is widespread among smaller operators
## Nutrient management BMPs included in NMPs

<table>
<thead>
<tr>
<th>Practice</th>
<th>Percent of Farms Using Each Practice</th>
<th>Ratio Not Receiving to Receiving Cost-Share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Using Practice</td>
<td>Not Receiving Cost-Share</td>
</tr>
<tr>
<td>Conservation Practices Included in Nutrient Management Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer Incorporation/Injection</td>
<td>32.7%</td>
<td>30.9%</td>
</tr>
<tr>
<td>Manure Incorporation/Injection</td>
<td>20.8%</td>
<td>18.7%</td>
</tr>
<tr>
<td>Manure Transport</td>
<td>11.4%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Ammonia Emission Reduction</td>
<td>4.7%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Precision Agriculture</td>
<td>12.7%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Other BMPs</td>
<td>10.6%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Enhanced Techniques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerial Imagery and Strip Trials</td>
<td>4.5%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Corn Stalk Nitrate Testing</td>
<td>8.1%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Plant and Grain Analysis</td>
<td>9.1%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Other BMPs</td>
<td>4.7%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>
Nutrient management BMP use by farm size
Number of nutrient management BMPs contained in NMPs

<table>
<thead>
<tr>
<th>Number of Nutrient Management Practices</th>
<th>Percent of Sample with a Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>40%</td>
</tr>
<tr>
<td>1</td>
<td>30%</td>
</tr>
<tr>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>4+</td>
<td>5%</td>
</tr>
</tbody>
</table>

Number of Nutrient Management Practices by Sample Size:

- 1 to 9999
- 10,000 to 39,999
- 40,000 to 99,999
- 100,000 to 249,999
- 250,000 to 749,999
- 750,000+

12/7/2011
Conclusions

• Significant room for further reductions in nutrient runoff through expanded BMP adoption, cost sharing--especially on small farms.

• Small farms may contribute a significant share of nutrients: Farms with sales under $50,000 account for 21% of cropland, 26% of cattle, and 83% of horses.

• Documentation of runoff potential by farm size should be a research priority.