CEAP—Conservation Effects Assessment Project

The NRI-CEAP Cropland Survey

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Purpose of NRI-CEAP Survey

Designed to provide information on farming activities and conservation practices for use with physical process modeling to estimate the effects of conservation practices currently in place on the landscape.
Primary Sample Unit (PSU)
Sampling and Modeling Approach

- Farm survey data at NRI-CEAP sample points
- Field-level modeling using APEX
- Watershed modeling using HUMUS/SWAT
- Onsite (field-level) Effects
- Off-Site Water Quality Effects
Modeling Strategy

1. Estimate a CEAP Baseline using farmer survey information at NRI sample points

2. Construct an alternative scenario assuming “no practices”

Difference between these two scenarios represents the benefits of the accumulation of conservation practices currently in place on the landscape.
Characteristics of Survey

• 20,000 sample points
• Sample size designed for national and regional level reporting
• Represents acres of cultivated cropland in US
• Data collected over 4-year period—2003-2006
Survey Content

The survey obtains for each sample point:

- Three years of crop and cropping practice information
  - Crops grown, intended use, seeding rates, yields, etc.
  - Commercial fertilizer applications
  - Manure applications
  - Pesticide applications
  - Field operations, including tillage
  - Irrigation practices
- Integrated Pest Management Practices
- Conservation practices
- Conservation Program participation
Cropping Systems

Percent Acres

- **Corn-Soybean**: 36.8%
- **Wheat and wheat fallow**: 16.7%
- **Cotton and other (no CN or SB)**: 5.8%
- **Close grown crops (no CN, SB, or CT)**: 8.3%
- **Corn and other (no SB)**: 10.8%
- **Other crops**: 10.8%
- **Soybeans and other (no CN)**: 10.9%
Crop Rotation Plans

<table>
<thead>
<tr>
<th></th>
<th>Million acres</th>
<th>Percent acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres with crop rotation plan</td>
<td>223</td>
<td>73%</td>
</tr>
<tr>
<td>No crop rotation plan</td>
<td>83</td>
<td>27%</td>
</tr>
</tbody>
</table>
## Crop Rotation Plans

<table>
<thead>
<tr>
<th></th>
<th>Million acres</th>
<th>% total acres</th>
<th>% corn-soybean acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>corn-soybean 2 year</td>
<td>77</td>
<td>25%</td>
<td>82%</td>
</tr>
<tr>
<td>corn-soybean 3 year</td>
<td>13</td>
<td>4%</td>
<td>14%</td>
</tr>
<tr>
<td>corn-soybean 4 year or more</td>
<td>4</td>
<td>1%</td>
<td>4%</td>
</tr>
</tbody>
</table>
### Farming Practices

<table>
<thead>
<tr>
<th>Practice</th>
<th>Percent Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation used for any crop grown during the past 3 years</td>
<td>19%</td>
</tr>
<tr>
<td>Herbicides, fungicides, or other pesticides applied</td>
<td>88%</td>
</tr>
<tr>
<td>Commercial fertilizers applied</td>
<td>87%</td>
</tr>
<tr>
<td>Manure applied to the field during the past 3 years</td>
<td>9%</td>
</tr>
</tbody>
</table>
### Field Characteristics

<table>
<thead>
<tr>
<th>Description</th>
<th>Percent acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field has surface drainage structures</td>
<td>12%</td>
</tr>
<tr>
<td>Field has subsurface (tile) drainage</td>
<td>22%</td>
</tr>
<tr>
<td>Field adjacent to a water body or wetland</td>
<td>23%</td>
</tr>
<tr>
<td>Field has evidence of gully erosion</td>
<td>9%</td>
</tr>
<tr>
<td>Soil test performed within the past 5 years</td>
<td>53%</td>
</tr>
</tbody>
</table>
Current Status

• Database consists of survey data and APEX model results
• Databases will be completed by major river basin throughout 2008-09
• Upper Mississippi to be completed in June
• Other Mississippi River basins by end of 2008
• Remaining basins/regions in early 2009
• CEAP future plans include repeating survey in about 2011
Strengths of NRI-CEAP Database

• NRI area sample frame
  – Captures diversity of soils, climates, terrain, farming activities, cropping patterns
  – Results represent the landscape condition

• All-crop survey with 3 years of information
  – Allows cropping system framework for analysis and reporting
  – Allows estimation of pollutant loadings from cropland

• Conservation treated acres identified
  – Allows estimation of conservation practice effects
  – Allows estimation of conservation treatment needs
Weaknesses of NRI-CEAP Database (for uses other than designed)

- Designed for national and regional reporting—usually not reliable for smaller areas
- Not representative of landowner/operator population—all results are in terms of acres
- Survey content restricted to attributes needed to assess the effects of conservation practices