Conservation and Current Production Margins:

Is Water Quality Compatible With My Cost Structure?
Jason Gomes
- CCA
- Northeast and East Central Iowa
- Independent Agronomy Services, NRCS Technical Service Provider

North Iowa Agronomy Partners, LLC
- Agronomy, Nutrient Management, Soil Sampling, Crop Planning, Product Recs, etc.
- Conservation Planning, Technical Assistance and Outreach in Upper/Middle Cedar Watersheds
Current Projects:

Middle Cedar Partnership Project
  City of Cedar Rapids, Miller Creek & Benton-Tama WQI Projects

Middle Cedar Watershed Management Authority

Midwest Ag RCPP
  Iowa Department of Ag and Land Stewardship
Our Role

• Technical Assistance
• Conservation Planning
• Outreach
  • Facilitate access to financial assistance
### T-Charts & Partial Budgets

The T-Charts & Partial Budgets are used to compare total benefits with total costs. These models are particularly useful when the potential for social or environmental costs or benefits is excluded. This approach focuses on quantifiable economic outcomes, making it a powerful tool for decision-making in economic evaluations.

#### Positive Effects

<table>
<thead>
<tr>
<th>Reduced Cost</th>
<th>Increased Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ac./yr</td>
<td>Cover crop seed (product &amp; application) $23.00 /ac./yr</td>
</tr>
<tr>
<td>/ac./yr</td>
<td>Herbicide (product &amp; application) $8.00 /ac./yr</td>
</tr>
<tr>
<td>/ac./yr</td>
<td>Increased management of cover crops $0.25 /ac./yr</td>
</tr>
<tr>
<td>/ac./yr</td>
<td>1 hr x $20/80</td>
</tr>
</tbody>
</table>

#### Increased Revenue

<table>
<thead>
<tr>
<th>Soybean yield increase by 1 bu/ac</th>
<th>/ac./yr</th>
<th>Possible reduced corn yield (no estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bu/ac x $8.5/bu</td>
<td>$8.50</td>
<td></td>
</tr>
</tbody>
</table>

#### Reduced Revenue

<table>
<thead>
<tr>
<th>Other</th>
<th>/ac./yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet/rill erosion and sediment delivery reduced by 160 tons/year improving off-site water quality.</td>
<td>/ac./yr</td>
</tr>
<tr>
<td>Improved soil health- SCI increases from .125 to .487</td>
<td>/ac./yr</td>
</tr>
<tr>
<td>Increased infiltration may decrease ponding affect.</td>
<td>/ac./yr</td>
</tr>
<tr>
<td>Cover crops may reduce compaction issues.</td>
<td>/ac./yr</td>
</tr>
</tbody>
</table>

#### Other

- May be eligible for cost share $53.00 /ac./yr

#### Total Dollar Benefits

$41.50 /ac./yr

#### Total Dollar Costs

$31.25 /ac./yr

#### Total Benefits - Total Costs = Net Benefits

$10.25
Net Returns:

N-Rate: $5-7/ac
5-10% N Load Reduction

VRT Phos w/ Zero Rate: $6/ac
17% Phos. Load Reduction

Cover Crop following Corn: $15-35/ac Cost Share
minus $14-24/ac variable costs
31% N Load Reduction
29% Phos Load Reduction
### Nitrogen Rates

**State:** Iowa  
**Number of sites:** 222  
**Rotation:** Corn Following Soybean

<table>
<thead>
<tr>
<th>Nitrogen Price ($/lb)</th>
<th>Corn Price ($/bu)</th>
<th>Price Ratio</th>
<th>MRTN Rate (lb N/acre)</th>
<th>Profitable N Rate Range (lb N/acre)</th>
<th>Net Return to N at MRTN Rate ($/acre)</th>
<th>Percent of Maximum Yield at MRTN Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.37</td>
<td>4.02</td>
<td>8.09</td>
<td>142</td>
<td>129 - 155</td>
<td>916.42</td>
<td>99%</td>
</tr>
</tbody>
</table>

- Anhydrous Ammonia (82% N) at MRTN Rate (lb product/acre): 173
- Anhydrous Ammonia (82% N) Cost at MRTN Rate ($/acre): $52.54
Total N Rates

- Measure total applied nitrogen

- Eliminate “wasted” N (DAP, MAP)

- Use a nitrification inhibitor for Fall N

- Net Savings: $5-7/ac

- % Nitrate-N Reduction: 5-10%

**Field ID:** GSS2017IACM031

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>Tillage</th>
<th>Cover Crop</th>
<th>Primary N Timing</th>
<th>Primary N Form</th>
<th>Total N Rate (lb/ac)</th>
<th>Average Yield (bu/ac)</th>
<th>N Balance (lb/ac)</th>
<th>N removed by grain (lb/ac)</th>
<th>bu/corn per 1 lb N</th>
<th>lbs N per 1 bu corn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td>Spring</td>
<td>No Spring</td>
<td>Spring</td>
<td>NH3</td>
<td>187</td>
<td>234</td>
<td>30</td>
<td>157</td>
<td>1.3</td>
<td>0.8</td>
</tr>
</tbody>
</table>

ISU MRTN
Historic Rainfall:

Vinton 1942-2017 Annual Precipitation
### Phosphorus Rates

**Table 1. Phosphorus recommendations for corn and soybean production when utilizing various extraction methods.**

<table>
<thead>
<tr>
<th>PPM</th>
<th>Very Low</th>
<th>Low</th>
<th>Optimum</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bray P and Mehlich-3 P</td>
<td>0-8</td>
<td>9-15</td>
<td>16-20</td>
<td>21-30</td>
<td>31+</td>
</tr>
<tr>
<td>Olsen P</td>
<td>0-5</td>
<td>6-9</td>
<td>10-13</td>
<td>14-18</td>
<td>19+</td>
</tr>
<tr>
<td>Mehlich-3 (CP P)</td>
<td>0-15</td>
<td>16-25</td>
<td>26-35</td>
<td>36-45</td>
<td>46+</td>
</tr>
</tbody>
</table>

**P₂O₅ to apply (lb/acre)**

<table>
<thead>
<tr>
<th></th>
<th>Corn</th>
<th>Soybean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bray P</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Olsen P</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>Mehlich-3 (CP P)</td>
<td>58</td>
<td>40</td>
</tr>
</tbody>
</table>

- **Optimum** = 25% Chance of Profitable Yield Response
- **High** = Less than 5% Chance of a Profitable Yield Response
Phosphorus Rates

- Optimum = 25% Chance of Yield Response
- High = Less than 5% Chance of Yield Response
- NE Iowa: Fall P2O5 - $0.47/lb  Spring P2O5 - $0.514
### Iowa Soil Phosphorus Averages

<table>
<thead>
<tr>
<th>Year</th>
<th>All of Iowa</th>
<th>N East Iowa</th>
<th>NIAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Average</td>
<td>Average</td>
<td>Average</td>
</tr>
<tr>
<td>Spring Avg</td>
<td>44.0</td>
<td>43.7</td>
<td>47.8</td>
</tr>
<tr>
<td>Fall Avg</td>
<td>40.3</td>
<td>42.8</td>
<td>41.8</td>
</tr>
<tr>
<td>Annual Avg</td>
<td>41.5</td>
<td>43.2</td>
<td>43.0</td>
</tr>
</tbody>
</table>
Nitrogen

Higher N rates, fall application, and additional drainage tile as a response to climate uncertainty.

Full rate of N-Serve = $10-11/ac, Fall NH₃ = $0.28/unit N.

Phosphorus

Soil as a “bank” for excess fertility. If I can eliminate chemical fertility as a yield limiting factor, why wouldn’t I?

Tax liability management.

How accurate are soil tests anyway?
What’s the point?

Farmers are responding to the market signals and incentives that make the most sense for their business.

What structural changes would be required to incentivize conservation?
Outcome-Based Payments

Diversity

Scale
Every advantage in the market favors scaling up farm size.

Land Market Correction or disincentives for opportunity hoarding.
Questions?

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