Conestoga Reverse Auction

An approach to maximize cost-effectiveness of conservation payments

Suzie Greenhalgh (LCR) & Mindy Selman (WRI)

ERS
April 17-18 2012
Reverse Auctions

Reverse Auction:

- Competitive bidding system with single buyer and multiple sellers
- Allocates funding based on cost-effectiveness
- Use budget constraint or breakpoints
Conestoga Reverse Auction

Conestoga Watershed (PA):
- Predominantly in Lancaster County
- Phosphorus impaired watershed
- Primarily agricultural

Auction Details:
- 2 auctions conducted
  - June 2005 (trial auction)
  - Oct 2005-Feb 2006
- Budget constraint (90K – Auction 1; 450K – Auction 2)
- Aim—purchase lbs of P reduced from BMPs
- Used NutrientNet to estimate P reductions from BMP
- Bids ranked by cost-effectiveness
Auction Rules:

- EQIP-eligible practices
- Auction 1—bids constrained to EQIP standard rates
- Auction 2—no constraints on bid price

Auction Administration:

- LCCD technicians worked with local producers to estimate P reductions and determine bids
- Bids submitted up to the auction close deadline (bid revisions allowed up to deadline)
- Bids were ranked by cost-effectiveness ($ per lb/P)
- Bids funded until auction budget was exhausted
EQIP Program

- State ranking system to allocate funds based on National, state, local resource concerns
- PA ranking forms—Livestock, Grazing, Cropland, Nutrient management, Odor control
- Ranking forms
  - include criteria such as adopting certain practices and number of BMPs being adopted.
  - rarely include measures of cost-effectiveness.
- Funding allocated according to score until budget is exhausted
- Pays cost-share of 50-75% of project cost
- Fixed rate payments for most BMPs
EQIP & Auction Comparison

- Compared Dec 2005 EQIP funding to second reverse auction
- Used artificial budget constraint of $293,000 for reverse auction

<table>
<thead>
<tr>
<th></th>
<th>No. of Applications</th>
<th>No. Funded Applications</th>
<th>Total Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQIP</td>
<td>19</td>
<td>13</td>
<td>$275,552</td>
</tr>
<tr>
<td>Reverse Auction</td>
<td>23</td>
<td>13 (7)</td>
<td>$446,990 ($293,000)</td>
</tr>
<tr>
<td>(artificial constraint)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# EQIP & Reverse Auction

<table>
<thead>
<tr>
<th></th>
<th>Livestock Management</th>
<th></th>
<th>Field Management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EQIP</td>
<td>Reverse Auction</td>
<td>EQIP</td>
<td>Reverse Auction</td>
</tr>
<tr>
<td>No. of funded projects (%)</td>
<td>9 (69%)</td>
<td>5 (71%)</td>
<td>4 (31%)</td>
<td>2 (29%)</td>
</tr>
<tr>
<td>Program Cost (% budget)</td>
<td>$184,262 (67%)</td>
<td>$288,957 (99%)</td>
<td>$91,290 (33%)</td>
<td>$3,679 (1%)</td>
</tr>
<tr>
<td>Reduction in P losses (% total reduction)</td>
<td>6,941 (66%)</td>
<td>79,982 (99%)</td>
<td>3,579 (34%)</td>
<td>805 (1%)</td>
</tr>
</tbody>
</table>
Comparing Contract Payments

Contract Payment ($'000)

Contract

EQIP
Reverse Auction
Comparing P Reductions

![Graph showing reduction in P losses for EQIP and Reverse Auction contracts.](graph.png)
Comparing Cost-Effectiveness

![Graph showing price per pound P reduction over bid number for EQIP Contracts and Reverse Auction. The red line represents EQIP Contracts reaching an artificial budget constraint at $15.72. The green line represents the Reverse Auction reaching a budget constraint at $209.26.](image)
## Comparing Cost-Effectiveness

<table>
<thead>
<tr>
<th>Program</th>
<th>No. of Funded Projects</th>
<th>Total Cost ($)</th>
<th>Total P Reduced (lbs)</th>
<th>Cost-Effectiveness (average $/lb P reduced)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQIP</td>
<td>13</td>
<td>275,552</td>
<td>10,520</td>
<td>$26.19</td>
</tr>
<tr>
<td>Reverse Auction</td>
<td>7</td>
<td>292,635</td>
<td>80,787</td>
<td>$3.62</td>
</tr>
</tbody>
</table>
Why the Difference?

Variation in program emphasis:
• Single vs multiple resource concerns
• Environmental outcome vs BMP adoption
• Applicant pool
Summary

- Reverse auction was 7 times more cost-effective than traditional funding
- Competitive bidding provides incentive to reveal minimum willingness to accept
- Auctions are effective mechanisms for maximizing environmental outcomes while minimizing public expenditures
Questions

Mindy Selman
(mindy.selman@wri.org)
202-729-7644

Suzie Greenhalgh
(greenhalghs@landcarereresearch.co.nz)
+61-9-574 4132

Project Partners: WRI, LCCD, Pennsylvania Environmental Council, Conservation Fund, Natsource

Special thanks to: USDA/NRCS for CIG funding and access to EQIP data