Economics of Manure Bartering

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Why Barter

- Manure has fertilizer value
- Fields without manure history can benefit
- Value to fields with high fertility is less than fields with low fertility.

Regional View

- Michigan: Online list of manure producers/cash grain farmers
- Illinois: Co-ops as brokers in some cases
- Ohio: State licensing of brokers

Wisconsin Approach

Common types of exchanges

- Dutch Treat
- Manure for Feed
- Manure for Cash
- Manure for Services

Why Barter

- More even distribution of nutrients across watershed
- Regulations may force manure distribution
- Higher fertilizer prices make it more feasible

Wisconsin: Dairy farmers don’t want to be on a list of those with “too much manure”
Dutch Treat Barter
- Farmers have land closer to another farm's manure source
- Each agrees to haul a set amount of manure to the other's property
- Both save time, wear and tear
- Both benefit from manure's nutrients

Dutch Treat - Obstacle
- 10,000+ cars per day = major hassle
- Can we put silage on the safer side of the road?

Dutch Treat Barter - Distance
- 20 Acre Field
- Each farmer saves 2 miles each way
- 3 Loads per acre = 240 miles saved/10 hours labor
- Corn field planted 1 day earlier

Obstacle
- 10,000+ cars per day = major hassle
- Can we put silage on the safer side of the road?

Manure for Feed
- Dairy farmer agrees to buy certain amount of feed at set price
- Cash grain farmer agrees as part of contract to take so much manure
Manure for Cash

- Cash grain farmer agrees to pay a certain amount for the manure
- Amount based on:
  - Hauling cost
  - Nutrient value
- Who check is made out to has tax consequences

Utilization of Dairy Slurry: Resource or Waste?

- Hauling cost
- Nutrient value

Potential Solution
- Shared costs: dairy & grain farmer

Manure for Services

- Cash grain producer trades services for manure
  - Feed hauling
  - Tractor use
  - Tillage

Study Objective

Evaluate the economics of transporting liquid dairy manure, and its potential as nutrient source in cash grain systems.

Issues Addressed:
1. How much to load and haul: 1 to 5 miles?
2. What is the value of liquid dairy manure in corn?
3. How far could liquid manure be hauled if costs are shared: dairy and grain?

Factors Affecting the Economics of Transporting Liquid Manure

Costs
1. Manure hauling and spreading costs
2. Fuel price
3. Fertilizer prices

Value of Manure
1. Fertilizer Replacement
   - Manure nutrient content
   - Crop nutrient needs
   - Soil test levels
2. Is there a market value?
   - Manure for forages
   - Grain farmer pays fuel
   - 50/50 split of manure management expenses
**Manure Hauling Costs - 2005**

- 2 million gallon pit
- ~200 acres
- 1 mile from pit
- Bid: $9,283
- Fuel: $3,422
- Tot: $12,705

**Manure Hauling Costs - 2008**

- 20% change in diesel price = minimal impact on spreading radius
- 20% change in N price = 0.4 mile change in breakeven distance

**Variability of Slurry Nutrient Content**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Nutrient Concentration</th>
<th>High Concentration</th>
<th>Low Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (lb/10,000 gal)</td>
<td>Market Value at 1 lb</td>
<td>Market Value at 1 lb</td>
</tr>
<tr>
<td></td>
<td>Mean + 1 SD</td>
<td>Market Value at 1 lb</td>
<td>Market Value at 1 lb</td>
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<tr>
<td></td>
<td>Mean - 1 SD</td>
<td>Market Value at 1 lb</td>
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<tr>
<td>N</td>
<td>0.34</td>
<td>8.26</td>
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</tr>
<tr>
<td>P2O5</td>
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<tr>
<td>K2O</td>
<td>0.25</td>
<td>15.86</td>
<td>66.02</td>
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<tr>
<td>S</td>
<td>0.27</td>
<td>0.40</td>
<td>1.21</td>
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</tbody>
</table>

**Soil Test Levels & Corn Nutrient Needs**

- Soil Test P:
  - Statewide Ave.: 52ppm
  - Dane/Columbia Ave.: 58ppm
  - Excessively high range
  - UWEX recommendation: 0 lbs / acre

- Soil Test K:
  - Statewide Ave: 141ppm
  - Dane/Columbia Ave.: 163ppm
  - Excessively High range
  - UWEX recommendation: 0 lbs / acre

*(Peters 2005 & A2809)*

**Overview of Variables**

1. 108 potential combinations
2. Focus on a few key variables
3. Change in single variable holding all else constant

- 2 – methods of covering hauling expenses
  - Dairy covers all → own land
  - “shared payment”
- 2 – soil test levels
  - Optimum: N:P:K needed
  - Excessively High: N-only needed
- 3 – levels of slurry nutrients
  - Mean
  - Mean + 1x.d.
  - Mean – 1x.d.
- 3 – N prices
  - 1999
  - 2005
  - 2005 + 20%
Effect of High Soil Test Level
average slurry nutrients
N - Only

Effect of Optimum Soil Test Level
average slurry nutrients
N:P:K

Effect of High Soil Test Level
average slurry nutrients
N - Only

Effect of Optimum Soil Test Level
average slurry nutrients
N:P:K

Effect of High Soil Test Level
average slurry nutrients
N - Only

Effect of Optimum Soil Test Level
average slurry nutrients
N:P:K
Effect of Slurry Nutrient Content
“shared payment”
optimum soil test: N:P:K

<table>
<thead>
<tr>
<th>Distance from Slurry Pit (miles)</th>
<th>$0</th>
<th>$20</th>
<th>$40</th>
<th>$60</th>
<th>$80</th>
<th>$100</th>
<th>$120</th>
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</thead>
<tbody>
<tr>
<td>$62.92</td>
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Conclusions
1. Hauling dairy slurry is very expensive
2. Dairy hauling to owned land
   - N-only: not profitable
   - N:P:K: 1.6 miles
     - average slurry
3. Most important factors (shared costs)
   - Nutrient level of soil: 2.6 → 4.5 miles
     - ave. slurry
   - Nutrient content: 3 → >5 miles
     - ± 1 s.d.
     - N:P:K

Potential “win win” situation
- Dairy: Hauling Costs, NMP
- Grain: Increased profitability, soil quality
Other Considerations

- WRITTEN CONTRACT IS ESSENTIAL
- Who provides 590?
- Incorporation time / mud on road cleanup
- Who is responsible for manure sample?

Field Responsibility

- If field is too wet, can either party delay application?
- Who is authorized to approve other fields?
- If manure is different than anticipated, (lower NPK), is there a remedy?

Legal Responsibility

- Spill insurance?
- Accident during transport?
- Ensuring manure applied according to plan

Summary

- Your land base may trump economic factors
- Carefully consider all aspects before signing an agreement

Other Considerations

- Legal Responsibility
  - Penalty for breach of contract?
  - Length of contract?
  - Recordkeeping responsibility?

Summary

- Talk to other dairy producers about their experiences
- Talk to your custom manure hauler
- A written contract is essential
Questions?

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