Milk House Wastewater Treatment System Selection & Economics

Kevin Janni
Bioproducts & Biosystems Engineering
University of Minnesota

Operation Factors
• Number of cows
• Water use
• Wastewater strength

Farm Site Factors
• Available area
• Depth to seasonal high water table or bedrock
• Soil texture
• Site elevations
• Distances to wells and surface waters

Farmstead Factors
• Milk house effluent pipe elevation
• Farmstead space

Management & Economics
• Owner preference
• Operation and maintenance requirements
• Capital investment
• Operating costs

Initial and Operating Costs

<table>
<thead>
<tr>
<th>System</th>
<th>Initial ($/ system)</th>
<th>Operating ($/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td>$6,000 to $10,000</td>
<td>$150</td>
</tr>
<tr>
<td>Bark bed</td>
<td>$6,000 to $10,000</td>
<td>$150</td>
</tr>
<tr>
<td>ATU</td>
<td>$10,000 to $20,000</td>
<td>$300</td>
</tr>
<tr>
<td>RMF</td>
<td>$12,000 to $20,000</td>
<td>$200</td>
</tr>
</tbody>
</table>

1 Equipment and installation
2 Estimated
Operation and Maintenance

- Electricity for pumps and blowers
- Annual septic tank pumping ($100/year)
- Maintenance for long term operation
  - Check effluent filters
  - Pumps and blowers
  - Bark Replacement
  - Rodent management
- Miscellaneous repairs

Storage with Land application

Assume

- Lined storage pond costs $0.90 per ft³ or $0.12 per gal
- Manure land application costs $10 per 1,000 gal or $0.01 per gal

Find storage cost

Given

- 60 cow herd and 5 gpd/cow
1) Find annual volume
2) 60 cows * 5 gpd/cow * 365 d/yr
   = 109,500 gal/yr
3) Find cost of storage
   = $0.12/gal * 109,500 gal
   = $13,140

Find land application cost

Given

- 60 cow herd
- 5 gpd/cow
1) Annual volume = 109,500 gal/yr
2) Find application cost
   = $0.01/gal * 109,500 gal/yr
   = $1,095/yr

Total cost

Assume 15 year life

- Manure storage $13,140
- Land application
- $1,095/yr * 15 yr = $16,425
- Total cost $29,565

Questions?

Visit www.manure.umn.edu and click on Milk House Waste

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