Re-Building a Sustainable Land Application Program Using Dried Class A Biosolids

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Why?

There are more than 14,000 wastewater treatment plants in the US treating approximately 32 billion gallons of wastewater each day. (EPA, 2016)

From that volume nearly 8 million dry tons of biosolids are produced each year.

Agriculture is the most widely employed method for reuse of biosolids.
Class B Biosolids vs Dried Class A Biosolids

*Is Land Application of Class B Sustainable?*
All RMI Class B Permitted Sites

Active Class B Permitted Sites
Distribution of RMI's Class B Biosolids Acreage

- Inactive Acres - PFAS, 257.3, 14%
- Inactive Acres - Neighbors, 279.8, 15%
- Inactive Acres - Landowner change, 214.3, 12%
- Inactive Acres - Crop Changes, 90.6, 5%
- Active Acres, 998, 54%
Class B Biosolids vs Dried Class A Biosolids

**Class B Biosolids**
- Often Odorous
- Additional Restrictions on Siting/Permitting
- 65-80% Water
- Public Perception Issues
- Doesn’t Always Align with Evolving Farming Practices
- Decreasing Market Stability

**Dried Class A Biosolids**
- Little to No Odor
- Minimal Siting Restrictions
- 1-10% Water
- Marketable
- Aligns with All Farming Practices
- Risk Management Tool

**Beneficial Reuse**
**Nutrient Rich**
**Organic Matter**
**Carbon Sequestering**
Regulatory Challenges

**CLASS B**

- Site Permitting Requirements
- Strict Stockpile Regulations – compliance often requires moving material twice
- Local Ordinances ban or severely restrict
- Sampling, Analysis, and Numerical Limits for Pollutants
- Additional Monitoring, Recordkeeping, & Reporting

**30% of employee time for 10% of the tonnage**

**DRIED CLASS A**

- Simple Best Management Practices apply
- There are a handful of towns that ban or severely restrict **ALL** biosolids land application
- Sampling, Analysis, and Numerical Limits for Pollutants
- Monitoring, Recordkeeping, & Reporting
## Farming practices

<table>
<thead>
<tr>
<th>CLASS B</th>
<th>DRIED CLASS A</th>
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</thead>
<tbody>
<tr>
<td>Must have permitted acreage in both grass and corn to manage year round</td>
<td>More easily utilized mid-season between grass cuts</td>
</tr>
<tr>
<td>Modern crop rotations – alfalfa or vegetables – reduce the amount of biosolids that can be used</td>
<td>Can be used with crop rotations that involve crops for human consumption (no extensive waiting periods)</td>
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<tr>
<td>No-till = great for soil, bad for odor and phosphorus</td>
<td>Less odor when topdressed, more suitable for no-till</td>
</tr>
<tr>
<td>Lime-stabilized class B cannot be used repeatedly on the same field</td>
<td>Will not raise soil pH, can be used indefinitely</td>
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## Perception challenges

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<tr>
<td>The public wants “Class A” not “Class B”.</td>
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<tr>
<td>Town Meetings and/or Board of Health Review requires lots of education and energy and do not always go well.</td>
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<tr>
<td>Neighbors, Odor, and Trucks, oh my!</td>
<td></td>
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<tr>
<td>Still challenges, but far less.</td>
<td></td>
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<tr>
<td>Less odorous, less trucks rolling through the neighborhood, smaller stockpiles.</td>
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<tr>
<td>Several name brand dried Class A products sold in retail stores successfully (ex. Milorganite, Bay State).</td>
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Increasing Wet Weather Events

2019 Wet Weather Events Caused:

- Stockpile Siting Issues
- Delivery Issues
- Spreading Issues
Land Application Cost Savings

10 tons of Class B = 85-100# of nitrogen
2 tons dried Class A = up to 120# N
Trucking Cost Savings

Class B Biosolids Generator:
- 10,000 tons of biosolids in year
- Pay $15/ton to truck away
- $150,000 to truck 80% water

Dried Class A Generator:
- 10,000 becomes 3,000
- $45,000 to truck 0-10% water
- save $105,000 regardless of how the material is managed
Drying as a Risk Management Tool

Biosolids Market Volatility

◦ Cost per ton over time 3.5-5% traditional annual increase, of 35-55% within the past 6 months, mostly related to recent PFAS uncertainty.

◦ An increasing number of farmers would rather pay for conventional fertilizer than deal with the scrutiny that can come with using biosolids.

◦ As a result, alternative management practices (landfill, incineration, etc.) have caused increases in trucking fees, tipping fees, and management fees.

Same great fertilizer with less volume = less inventory liability, less to manage whether land application continues or not.
Anaerobic Digestion + Drying

The two are not mutually exclusive:

Anaerobic Digestion is great for decreasing volume and capturing biogas as an alternative energy source.

At the end, you are still left with 20-30% solids wet cake – which should be dried!

A complimentary relationship - backup solutions when either system is down.
If you are thinking of a solids handling upgrade at your plant...

Skip Class B and go straight to Class A!
Consider a dryer, stop trucking water.

Questions?