Manure Sampling in N.C.

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Poultry Litter Sampling

N.C. FY2005-09
Average Nutrient Availability (lb/ton)

The archived presentation is available at:
https://articles.extension.org/pages/21819/chronological-webcast-archive
When/where to sample?

- Sub-samples collected from at least 10-12 locations.
- Sub-samples extend from the top to the bottom of the accumulated waste.
- Sub-samples taken around waterers, feeders and brooders in proportion to the space these areas occupy in the house.
- Use wheelbarrow or larger container to ensure complete mixing of sub-samples.

Before Cleanout

Sub-samples collected from at least 10-12 locations.
Sub-samples extend from the top to the bottom of the accumulated waste.
Sub-samples taken around waterers, feeders and brooders in proportion to the space these areas occupy in the house.
Use wheelbarrow or larger container to ensure complete mixing of sub-samples.

Point sampling in poultry house before cleanout

Zone identification and sampling patterns in a poultry house
After Cleanout

Sampling Animal Manure (UK Factsheet)

http://www2.ca.uky.edu/agcomm/pubs/id/id148/id148.pdf

Lagoon Sampling
Why sample swine lagoons?
(1) Maintain Lagoon Performance
(2) Meet Permit Requirements

What is being analyzed?
(1) Nutrient content
(2) Sludge level surveys

N.C. General Permit requirement for lagoon-based waste systems:
• “An analysis of a representative sample of the waste to be applied shall be conducted within 60 days (before or after) of the date of application.”
• “All facilities shall conduct a survey of the sludge accumulation in all lagoons every year.”
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What not to do, on a boat, in a lagoon!

Sampling Sludge Prior to Agitation

1. If irrigating, take a lagoon core (contaminant and sludge)
2. If dewatering lagoon, sample sludge only

Take at least 5 samples from around the lagoon, mix thoroughly and send sub-sample to lab

Sludge Surveys
How do we measure the depth of supernatant?

1. Sludge gun – infrared sensors
2. Disk-on-rope
3. Bucket Lid on pole
4. Sludge Judge*
5. Sonar devices* (fish finder)

* Requires some experience to use reliably

Top of dense sludge (0.1 lb/sq.in.)

Lagoon bottom survey (calibrated PVC pole)

Sludge Gun (infrared)
Livestock and Poultry Environmental Learning Center Webinar Series

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Only 4 openings in lagoon cover

Each opening is 24-inch diameter but has other objects in the way
### Sludge surveys before and after lagoon was covered (approx. 1-year difference)

<table>
<thead>
<tr>
<th>Average Depth of Sludge (ft)</th>
<th>Lagoon 1</th>
<th>Lagoon 2</th>
<th>Lagoon 3</th>
<th>Lagoon 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-cover survey</td>
<td>4.2</td>
<td>3.0</td>
<td>2.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Post-cover survey</td>
<td>3.7</td>
<td>3.4</td>
<td>3.9</td>
<td>2.6</td>
</tr>
<tr>
<td>Change in depth</td>
<td>-0.5</td>
<td>0.4</td>
<td>1.0</td>
<td>0.2</td>
</tr>
</tbody>
</table>

### Repeatability, Same Lagoon, Same Day

![Box plot showing depth-to-sludge measurements with and without cover.](image)

### Effect of Cover Material on Depth Measurements

<table>
<thead>
<tr>
<th>Location</th>
<th>Location 2</th>
<th>Location 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth to Sludge without cover (ft)</td>
<td>Depth to Sludge with cover (ft)</td>
<td>Depth to Sludge with cover (ft)</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Location 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
</tr>
<tr>
<td>7.8</td>
<td>7.9</td>
<td>7.9</td>
</tr>
<tr>
<td>7.7</td>
<td>7.6</td>
<td>7.6</td>
</tr>
<tr>
<td>Average</td>
<td>7.8</td>
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</tr>
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</table>

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Long Term Sludge Depths

Treated Lagoon

Untreated Lagoon

Sludge Survey Methods for Anaerobic Lagoons


Question?

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