Chapter 6: Record Keeping

Growers who use waste materials as fertilizer or a source of lime must maintain records of the analytical results, application rates, and soil tests for each application site. This section will address the importance of Records Management as a vital part of an animal waste management system. Recommendations for the land application of animal waste should be based on actual laboratory analysis from a sample of your waste lagoon, storage pond, or solids dry stack. In Chapter 3, you determined the amount of waste to be handled. Then, with an analysis of the waste, you determined how much of the waste you could apply to a given crop or crop system over a year’s time. When combined with the calibration section, you determined how long you should operate your equipment to apply just the right amount as prescribed in your waste utilization plan, and to apply the waste at no greater than agronomic rates as required by law.

A certain amount of record keeping is needed to keep up with the management of the waste application system. The record keeping forms provided here will help you document site specific data which is currently limited on many animal operations. These forms will allow you to easily track your waste applications and provide you with an easy resource to ensure that you do not exceed waste applications to any fields.

These forms, when combined with your site specific data such as your waste analysis, plant analysis, soils analysis, crop yields, and other farm plan items, will provide evidence that you are managing your waste application properly and not exceeding agronomic rates.

Keeping accurate records, along with the implementation of proper BMPs on your farm, is the primary way you prove to the Division of Water Quality (DWQ), the Division of Soil and Water Conservation (DSWC), and to the general public that your animal waste management system is not causing an environmental impact. Assistance with record keeping can be obtained from a Certified Technical Specialist or the Cooperative Extension Service, the Natural Resources Conservation Service, the local Soil and Water Conservation District, or the Agronomic Division of NCDA.
Chapter 6: Record Keeping

Describe what records need to be maintained to show compliance with environmental regulations.

In order to satisfy the Division of Water Quality’s and Division of Soil and Water Conservation farm inspection procedures, the following items need to be available at the individual farm:

1. Waste application records
2. Map of farm fields including waste application fields and acreage
3. Certified Waste Management Plan (if applicable)
4. Waste sample analysis
5. Annual soil analysis for each field receiving waste applications

These records must be maintained for a period of five years at the individual farm.

Describe what is to be done with records.

It may be beneficial for you to maintain the additional following records for verification of conditions on your farm (you should review your general permit to see if there are any of these or other items which may be required to be maintained to be compliant with DWQ guidelines):

1. Daily farm rainfall records
2. Weekly lagoon level (freeboard) records
3. Plant analysis
4. Animal population
5. Crop yields
6. Surface water and groundwater quality records

Forms included here are:

1. **IRR-1**: Lagoon Liquid Irrigation Field Record is to be used to record each irrigation event.

2. **IRR-2**: Cumulative Lagoon Liquid Irrigation Field Record is to record the total annual waste application to one field per crop cycle. It provides for calculating the total nitrogen application to the field and comparing it to the recommended nitrogen loading rate.

3. **SLUR-1**: Liquid Manure Slurry Field Record is to be used to...
record each waste application event if the producer is using a slurry or pump and haul system.

4. **SLUR-2**: Cumulative Liquid Manure Slurry Field Record is to record the total annual waste application to one field per crop cycle with a slurry or pump and haul system. It provides for calculating the total nitrogen application to the field and comparing it to the recommended nitrogen loading rate.

5. **SLD-1**: Solid or Semisolid (dry stack) Field Record is to be used to record each waste application event if the producer is using a manure/box spreader.

6. **SLD-2**: Cumulative Solid Field Record is to record the total annual waste application to one field per crop cycle. It provides for calculating the total nitrogen application to the field and comparing it to the recommended nitrogen loading rate.

The record forms IRR-2, SLUR-2, and SLD-2 require the operator to make calculations to determine the amount of N that has been applied to a given crop. The necessary formulas to complete the forms are provided in the first row of the form.

Note: For recording purposes, field size is that portion of the field that receives waste applications (often referred to as the “wetted area” when using irrigation). Wetted area is equal to or less than field size due to irrigation system layout and use of required buffers, or due to accessibility with spreader equipment.

1. Explain what waste management records must be maintained at an animal operation. ................................. see page 6-2

2. Describe what is to be done with waste application records. ............................................................. see page 6-2

3. Describe the difference between the field records (example IRR-1) and the cumulative total records (example IRR-2). .... see page 6-2

**Calculate and verify application rates through the use of waste application records.**
# Lagoon Liquid Irrigation Field Record
For Recording Irrigation Events on Different Fields

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Date (mm/dd/yr)</th>
<th>Crop Type</th>
<th>Field Size (acres)</th>
<th>Irrigation Time</th>
<th>Number of Sprinklers Operating</th>
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</thead>
<tbody>
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</tbody>
</table>
Form IRR-2
Lagoon Liquid Irrigation Field Record
One Form for Each Field Per Crop Cycle

Tract # | Field # | Facility Number
---|---|---

Field Size (acres) = (A)

Farm Owner

Owner’s Address

Owner’s Phone #

Irrigation Operator

Irrigation Operator’s Address

Operator’s Phone #

From Animal Waste Management Plan

Crop Type

Recommended PAN Loading (lb/acre) = (B)

<table>
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<tr>
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<th>(11)</th>
</tr>
</thead>
</table>
| Date (mm/dd/yr) | Start Time (hr:min) | End Time (hr:min) | Total Minutes (3 - (2)) | # of Sprinklers Operating | Flow Rate (gal/min) | Total Volume (gallons) | Volume Per Acre (gal/ac) | Waste Analysis ^1 PAN (lb/1000 gal) | PAN Applied (lb/ac) \[
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Form SLUR-1

Slurry and Sludge Application Field Record
For Recording Slurry Application Events on Different Fields

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Date (mm/dd/yr)</th>
<th>Crop Type</th>
<th>Field Size (acres)</th>
<th>Application Method</th>
<th># of Loads Per Field</th>
<th>Volume of Loads (gallons)</th>
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1 SI = soil incorporated (disked); BR = broadcast (surface applied)

2 Can be found in operator's manual for the spreader. Contact a local dealer if you do not have your owner's manual.
# Form SLUR-2

Slurry and Sludge Application Field Record  
One Form for Each Field Per Crop Cycle

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Facility Number</th>
</tr>
</thead>
</table>

**Field Size (acres) = (A)**

<table>
<thead>
<tr>
<th>Farm Owner</th>
<th>Spreader Operator</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Owner’s Address</th>
<th>Spreader Operator’s Address</th>
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<th>Owner’s Phone #</th>
<th>Operator’s Phone #</th>
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**From Animal Waste Management Plan**

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Recommended PAN Loading (lb/acre) = (B)</th>
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<tbody>
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</table>

**Crop Type**

<table>
<thead>
<tr>
<th>Date (mm/dd/yr)</th>
<th># of Loads Per Field</th>
<th>Volume of Loads 1</th>
<th>Total Volume (gallons) (2) × (3)</th>
<th>Volume Per Acre (gal/ac) (4) ÷ (A)</th>
<th>Waste Analysis ² PAN (lb/1000 gal) [(5) × (6)] ÷ 1,000</th>
<th>PAN Applied (lb/ac) (B) - (7)</th>
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**Crop Cycle Totals**

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<th>Owner’s Signature</th>
<th>Operator’s Signature</th>
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<tr>
<th>Certified Operator (Print)</th>
<th>Operator Certification #</th>
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1. Can be found in operator’s manual for the spreader. Contact a local dealer if you do not have your owner’s manual.

2. See your animal waste management plan for sampling frequency. At a minimum, waste analysis is required within 60 days of land application events.

3. Enter the value received by subtracting column (7) from (B). Continue subtracting column (7) from column (8) following each application event.
Form SLD-1
Manure Solids Application Field Record
For Recording Manure Solids Application Events on Different Fields

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Date (mm/dd/yr)</th>
<th>Crop Type</th>
<th>Field Size (acres)</th>
<th>Application Method ¹</th>
<th># of Loads Per Field</th>
<th>Volume of Loads ² (tons)</th>
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¹ SI = soil incorporated (disked); BR = broadcast (surface applied)
² Can be found in operator's manual for the spreader. Contact a local dealer if you do not have your owner's manual.
**Form SLD-2**

**Manure Solids Application Field Record**

One Form for Each Field Per Crop Cycle

<table>
<thead>
<tr>
<th>Field #</th>
<th>Facility Number</th>
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</table>

**Tract #**

**Field Size (acres) = (A)**

<table>
<thead>
<tr>
<th>Owner’s Address</th>
<th>Spreader Operator’s Address</th>
</tr>
</thead>
</table>

| Owner’s Phone # | Spreader Operator’s Phone # |

**From Animal Waste Management Plan**

| Crop Type | Recommended PAN Loading (lb/acre) = (B) |

| Date (mm/dd/yr) | # of Loads Per Field | Weight of Loads ¹ (tons) | Total Weight (tons) (2) × (3) | Weight Per Acre (tons/ac) (4) ÷ (A) | Waste Analysis ² PAN (lb/ton) (6) × (5) | PAN Applied (lb/ac) (B) - (7) |
|-----------------|----------------------|--------------------------|-----------------------------|--------------------------------------|----------------------------------|

| Crop Cycle Totals |

| Owner’s Signature | Operator’s Signature |

| Certified Operator (Print) | Operator Certification # |

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¹ Can be found in operator's manual for the spreader. Contact a local dealer if you do not have your owner’s manual.

² See your animal waste management plan for sampling frequency. At a minimum, waste analysis is required within 60 days of land application events.

³ Enter the value received by subtracting column (7) from (B). Continue subtracting column (7) from column (8) following each application event.
Example:

Irrigation Records using Forms IRR-1 and IRR-2:

Joe Pigford maintains a 3,000 head feeder-to-finish operation. His estimated volume of lagoon liquid generated annually is approximately 2.8 million gallons. He conducted a waste analysis on February 8, 1996 and April 10, 1996. Both analyses showed that the waste contained 2.5 pounds of plant-available nitrogen (PAN) per 1,000 gallons. He irrigates two crops with wastewater using a traveling gun that applies 300 gpm.

- Tract T1004: corn—traveling gun pulls are considered Fields 1 to 4, 6 acres each.

- Tract T1005: bermuda hay—traveling gun pulls are considered Fields 5 and 6, which are 8 and 4 acres respectively.
His waste utilization plan shows that his anticipated yield for corn is 100 bushels per acre and he should apply 1.0 pound of PAN per bushel yield. His yield of bermudagrass is estimated at 6 tons/acre and he should apply 50 pounds of PAN per ton of yield. His PAN application rates are as follows:

Tract T1004: PAN needed for corn:

\[
\frac{100 \text{ bu corn}}{\text{acre}} \times \frac{1.0 \text{ lb PAN}}{\text{bu}} = 100 \text{ lb PAN/acre}
\]

Tract T1005: PAN needed for bermuda hay:

\[
\frac{6 \text{ tons hay}}{\text{acre}} \times \frac{50 \text{ lb PAN}}{\text{ton}} = 300 \text{ lb PAN/acre}
\]

Joe’s Lagoon Liquid Irrigation Field Record (Form IRR-1) follows. Transfer the information for Fields 1 and 5 each onto a separate Form IRR-2 and complete the calculations to determine whether Joe has met his nitrogen requirement for his corn crop and bermuda hay.

Round off to one decimal point on the plant-available nitrogen applied shown in Column 10 on Form IRR-2.
<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Date (mm/dd/yr)</th>
<th>Crop Type</th>
<th>Field Size (acres)</th>
<th>Start Time</th>
<th>End Time</th>
<th>Total Minutes</th>
<th>Number of Sprinklers Operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1D04</td>
<td>1</td>
<td>3/20/96</td>
<td>corn</td>
<td>6</td>
<td>8:00 AM</td>
<td>2:30 PM</td>
<td>390</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3/21/96</td>
<td>corn</td>
<td>6</td>
<td>8:00 AM</td>
<td>2:30 PM</td>
<td>390</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3/22/96</td>
<td>corn</td>
<td>6</td>
<td>8:00 AM</td>
<td>2:30 PM</td>
<td>390</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3/23/96</td>
<td>corn</td>
<td>6</td>
<td>8:00 AM</td>
<td>2:30 PM</td>
<td>390</td>
<td>1</td>
</tr>
<tr>
<td>T1D05</td>
<td>5</td>
<td>3/26/96</td>
<td>bermuda</td>
<td>8</td>
<td>8:00 AM</td>
<td>4:40 PM</td>
<td>520</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>3/27/96</td>
<td>bermuda</td>
<td>4</td>
<td>3:00 PM</td>
<td>7:20 PM</td>
<td>260</td>
<td>1</td>
</tr>
<tr>
<td>T1D04</td>
<td>1</td>
<td>5/10/96</td>
<td>bermuda</td>
<td>6</td>
<td>8:30 AM</td>
<td>2:00 PM</td>
<td>330</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5/11/96</td>
<td>corn</td>
<td>6</td>
<td>8:30 AM</td>
<td>3:00 PM</td>
<td>390</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5/12/96</td>
<td>corn</td>
<td>6</td>
<td>8:30 AM</td>
<td>3:00 PM</td>
<td>390</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>5/13/96</td>
<td>corn</td>
<td>6</td>
<td>8:30 AM</td>
<td>4:00 PM</td>
<td>450</td>
<td>1</td>
</tr>
<tr>
<td>T1D05</td>
<td>5</td>
<td>5/16/96</td>
<td>bermuda</td>
<td>8</td>
<td>7:00 AM</td>
<td>11:40 PM</td>
<td>400</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>5/17/96</td>
<td>bermuda</td>
<td>4</td>
<td>3:00 PM</td>
<td>7:20 PM</td>
<td>260</td>
<td>1</td>
</tr>
<tr>
<td>T1D05</td>
<td>5</td>
<td>6/1/96</td>
<td>bermuda</td>
<td>8</td>
<td>8:00 AM</td>
<td>4:40 PM</td>
<td>520</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>6/2/96</td>
<td>bermuda</td>
<td>4</td>
<td>3:00 PM</td>
<td>7:20 PM</td>
<td>260</td>
<td>1</td>
</tr>
<tr>
<td>T1D05</td>
<td>5</td>
<td>7/20/96</td>
<td>bermuda</td>
<td>8</td>
<td>10:00 AM</td>
<td>3:30 PM</td>
<td>330</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>7/21/96</td>
<td>bermuda</td>
<td>4</td>
<td>4:00 PM</td>
<td>8:20 PM</td>
<td>260</td>
<td>1</td>
</tr>
</tbody>
</table>
Form IRR-2  
Lagoon Liquid Irrigation Field Record  
One Form for Each Field Per Crop Cycle

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field Size (acres) = (A)</th>
<th>Facility Number</th>
<th>Field #</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T004</td>
<td>6</td>
<td>99 - 999</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Farm Owner**
- **Name:** Joe Pigford  
- **Address:** 123 Hawg Road, Pigtown, NC 27344  
- **Phone #:** (919) 555-4444

**Irrigation Operator**
- **Name:** Joe Pigford  
- **Address:** Same  
- **Phone #:** Same

**Crop Type**
- **Type:** Corn

**Recommended PAN Loading (lb/acre) = (B)**
- **Value:** 10

**From Animal Waste Management Plan**
- **Loading (lb/acre):**
  - (1) = 300

**Irrigation Date**
- 3/20/96: 8:00 AM - 2:30 PM
  - Total Minutes: 390
  - Flow Rate: 300 gal/min
  - Volume: 117,000 gallons
  - Volume Per Acre: 19,500 gal/ac
  - Waste Analysis: 2.5
  - PAN Applied (lb/ac): 48.8
  - Nitrogen Balance: 512

- 5/10/96: 8:30 AM - 2:00 PM
  - Total Minutes: 330
  - Flow Rate: 300 gal/min
  - Volume: 99,000 gallons
  - Volume Per Acre: 16,500 gal/ac
  - Waste Analysis: 2.5
  - PAN Applied (lb/ac): 413
  - Nitrogen Balance: 9.9

**Crop Cycle Totals**
- **Volume:** 216,000 gallons
- **Nitrogen Balance:** 90.1

**Signatures**
- **Owner's Signature:** Joe Pigford  
- **Operator's Signature:** Joe Pigford  
- **Certified Operator (Print):** Joe Pigford  
- **Operator Certification #:** 0327

---

1 See your animal waste management plan for sampling frequency. At a minimum, waste analysis is required within 60 days of land application events.
2 Enter the value received by subtracting column (10) from (B). Continue subtracting column (10) from column (11) following each application event.
# Form IRR-2

## Lagoon Liquid Irrigation Field Record

One Form for Each Field Per Crop Cycle

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Facility Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1005</td>
<td>5</td>
<td>99 - 999</td>
</tr>
</tbody>
</table>

- **Field Size (acres) = (A)**: 8
- **Farm Owner**: Joe Pigford
- **Owner’s Address**: 123 Hawg Road, Pigtown, NC 27344
- **Owner’s Phone #**: (919) 555-4444
- **Irrigation Operator**: Joe Pigford
- **Irrigation Operator’s Address**: Same
- **Operator’s Phone #**: Same

### From Animal Waste Management Plan

- **Crop Type**: bermuda hay
- **Recommended PAN Loading (lb/acre) = (B)**: 300

<table>
<thead>
<tr>
<th>Date (mm/dd/yr)</th>
<th>Start Time (hr:min)</th>
<th>End Time (hr:min)</th>
<th>Total Minutes (3) - (2)</th>
<th># of Sprinklers Operating</th>
<th>Flow Rate (gal/min)</th>
<th>Total Volume (gallons)</th>
<th>Volume Per Acre (gal/ac)</th>
<th>Waste Analysis PAN (lb/1000 gal)</th>
<th>PAN Applied (lb/ac)</th>
<th>Nitrogen Balance (lb/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/26/96</td>
<td>8:00 AM</td>
<td>4:40 PM</td>
<td>520</td>
<td>1</td>
<td>300</td>
<td>56,000</td>
<td>9,500</td>
<td>2.5</td>
<td>48.8</td>
<td>2512</td>
</tr>
<tr>
<td>5/16/96</td>
<td>7:00 AM</td>
<td>1:40 PM</td>
<td>400</td>
<td>1</td>
<td>300</td>
<td>12,000</td>
<td>5,000</td>
<td>2.5</td>
<td>37.5</td>
<td>233.7</td>
</tr>
<tr>
<td>6/1/96</td>
<td>8:00 AM</td>
<td>4:40 PM</td>
<td>520</td>
<td>1</td>
<td>300</td>
<td>56,000</td>
<td>9,500</td>
<td>2.5</td>
<td>48.8</td>
<td>164.9</td>
</tr>
<tr>
<td>7/20/96</td>
<td>10:00 AM</td>
<td>3:30 PM</td>
<td>330</td>
<td>1</td>
<td>300</td>
<td>99,000</td>
<td>12,375</td>
<td>2.5</td>
<td>30.9</td>
<td>134.0</td>
</tr>
</tbody>
</table>

### Crop Cycle Totals

- **Crop Cycle Totals**: 531000 gal
- **Nitrogen Balance**: 166.0 lb/ac

---

1. See your animal waste management plan for sampling frequency. At a minimum, waste analysis is required within 60 days of land application events.
2. Enter the value received by subtracting column (10) from (B). Continue subtracting column (10) from column (11) following each application event.
例：

污泥应用记录使用表单SLUR-1和SLUR-2：

米尔基·史密斯经营一家120头奶牛的乳品生产，并生产出约1,000,000加仑的废物污泥。他于1996年3月1日对污泥进行了废物分析，并显示了该物质中含有每1,000加仑污泥中含有8.2磅的植物可用氮。他向四个田块进行废物应用，分别是：

- 田块1：玉米—24英亩
- 田块2：玉米—14英亩
- 田块3：百慕大草—16英亩
- 田块4：大豆—18英亩

他的废物利用计划显示，他预计的玉米产量是每英亩100蒲式耳，并应施用1.1磅PAN每蒲式耳的预计产量。因此他的PAN施用率如下：

田块1：PAN所需用于玉米：

\[
\frac{100 \text{ bu corn}}{\text{acre}} \times \frac{1.1 \text{ lb PAN}}{\text{bu}} = 110 \text{ lb PAN/acre}
\]

米尔基的污泥应用田块记录（表单SLUR-1）如下。将信息转移到表单SLUR-2并完成计算来确定米尔基是否满足他玉米在田块1的氮需求。他的施用设备是拖拉机拖拽的水箱（蜂蜜车）可容纳2,000加仑。
<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Date (mm/dd/yr)</th>
<th>Crop Type</th>
<th>Field Size (acres)</th>
<th>Application Method</th>
<th># of Loads Per Field</th>
<th>Volume of Loads (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1001</td>
<td>1</td>
<td>3/20/96</td>
<td>corn</td>
<td>24</td>
<td>BR</td>
<td>72</td>
<td>2,000</td>
</tr>
<tr>
<td>T1001</td>
<td>2</td>
<td>3/21/96</td>
<td>corn</td>
<td>14</td>
<td>BR</td>
<td>42</td>
<td>2,000</td>
</tr>
<tr>
<td>T1001</td>
<td>3</td>
<td>3/24/96</td>
<td>bermuda grass</td>
<td>16</td>
<td>BR</td>
<td>64</td>
<td>2,000</td>
</tr>
<tr>
<td>T1001</td>
<td>1</td>
<td>3/30/96</td>
<td>corn</td>
<td>24</td>
<td>BR</td>
<td>58</td>
<td>2,000</td>
</tr>
<tr>
<td>T1001</td>
<td>3</td>
<td>4/3/96</td>
<td>bermuda grass</td>
<td>16</td>
<td>BR</td>
<td>48</td>
<td>2,000</td>
</tr>
<tr>
<td>T1001</td>
<td>4</td>
<td>4/8/96</td>
<td>soybeans</td>
<td>18</td>
<td>BR</td>
<td>54</td>
<td>2,000</td>
</tr>
</tbody>
</table>

1. SI = soil incorporated (disked)  BR = broadcast (surface applied)
2. Can be found in operator's manual for the spreader. Contact a local dealer if you do not have your owner's manual.
### Form SLUR-2

#### Slurry and Sludge Application Field Record

One Form for Each Field Per Crop Cycle

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Facility Number</th>
<th>Spreader Operator</th>
<th>Owner's Phone #</th>
<th>Field Size (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T001</td>
<td>1</td>
<td>88 - 888</td>
<td>Milky Smith</td>
<td>(704) 222-3333</td>
<td>24</td>
</tr>
</tbody>
</table>

**Farm Owner**

- **Name:** Milky Smith
- **Address:** 164 Herd Way, Cowtown, NC 24568
- **Phone:** (704) 222-3333

**Spreader Operator**

- **Name:** Milky Smith
- **Address:** Same
- **Phone:** Same

**Crop Type:** corn

**Recommended PAN Loading (lb/acre) = (B)**

<table>
<thead>
<tr>
<th>Date</th>
<th># of Loads Per Field</th>
<th>Volume of Loads</th>
<th>Total Volume (gallons)</th>
<th>Volume Per Acre (gal/ac)</th>
<th>Waste Analysis PAN (lb/1000 gal)</th>
<th>PAN Applied (lb/ac)</th>
<th>Nitrogen Balance (lb/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/20/96</td>
<td>72</td>
<td>2,000</td>
<td>144,000</td>
<td>6,000</td>
<td>8.2</td>
<td>49.2</td>
<td>60.8</td>
</tr>
<tr>
<td>3/30/96</td>
<td>58</td>
<td>2,000</td>
<td>16,000</td>
<td>4,833</td>
<td>8.2</td>
<td>39.6</td>
<td>212</td>
</tr>
</tbody>
</table>

**Crop Cycle Totals**

- **Volume:** 10,833 gallons
- **Nitrogen Balance:** 88.8 lb/ac

**Certified Operator (Print):** Milky Smith

**Operator Certification #:** 1111

---

1. Can be found in operator’s manual for the spreader. Contact a local dealer if you do not have your owner’s manual.
2. See your animal waste management plan for sampling frequency. At a minimum, waste analysis is required within 60 days of land application events.
3. Enter the value received by subtracting column (7) from (B). Continue subtracting column (7) from column (8) following each application event.
Example:

John Manurehauler maintains a 80-head dairy operation and utilizes a dry stack waste storage system. He conducted a waste analysis of his dry stack on April 1, 1996 and it showed that the material contained 4.2 pounds of plant-available nitrogen (PAN) per ton of waste. He land applies the manure to two fields, these being:

Field 1: corn—12 acres  
Field 2: fescue pasture—27 acres

His waste utilization plan shows that his anticipated yield for fescue pasture is 4 tons hay per acre, and he should apply 50 pounds of PAN per ton of expected yield. He also must reduce his application rate by 25 percent due to grazing. Therefore his PAN application rate is as follows:

Step 1:

\[
\frac{4 \text{ tons fescue hay}}{\text{acre}} \times \frac{50 \text{ lb PAN}}{\text{ton of hay}} = 200 \text{ lb PAN / acre}
\]

Step 2:

Since the application rate for grazed land is 75 percent of the application rate for hay:

\[
\frac{200 \text{ lb PAN}}{\text{acre}} \times 0.75 = 150 \text{ lb PAN / acre}
\]

John’s Manure Solids and Sludge Application Field Record (SLD-1) follows. Transfer the information for Field 2 onto Form SLD-2 and complete the calculations to determine whether John has met his nitrogen requirement for his grazed fescue pasture. He utilizes an 8-ton manure spreader and surface applies (broadcasts) the manure.
Form SLD-1
Manure Solids Application Field Record
For Recording Manure Solids Application Events on Different Fields

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Date (mm/dd/yr)</th>
<th>Crop Type</th>
<th>Field Size (acres)</th>
<th>Application Method</th>
<th># of Loads Per Field</th>
<th>Volume of Loads ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2004</td>
<td>1</td>
<td>4/1/96</td>
<td>corn</td>
<td>12</td>
<td>SI</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>T2004</td>
<td>2</td>
<td>4/4/96</td>
<td>fescue</td>
<td>27</td>
<td>BR</td>
<td>60</td>
<td>8</td>
</tr>
<tr>
<td>T2004</td>
<td>1</td>
<td>4/10/96</td>
<td>corn</td>
<td>12</td>
<td>SI</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>T2004</td>
<td>2</td>
<td>6/12/96</td>
<td>fescue</td>
<td>27</td>
<td>BR</td>
<td>50</td>
<td>8</td>
</tr>
</tbody>
</table>

¹ SI = soil incorporated (disked); BR = broadcast (surface applied)
² Can be found in operator's manual for the spreader. Contact a local dealer if you do not have your owner's manual.
Form SLD-2
Manure Solids Application Field Record
One Form for Each Field Per Crop Cycle

<table>
<thead>
<tr>
<th>Tract #</th>
<th>Field #</th>
<th>Facility Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2004</td>
<td>2</td>
<td>55 - 555</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Farm Owner</th>
<th>Spreader Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>John A. Manurehauler</td>
<td>John A. Manurehauler</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner’s Address</th>
<th>Spreader Operator’s Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>269 Tanker Street</td>
<td>Same</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner’s Phone #</th>
<th>Operator’s Phone #</th>
</tr>
</thead>
<tbody>
<tr>
<td>(910) 777-9999</td>
<td>Same</td>
</tr>
</tbody>
</table>

Form SLD-2 includes the following information:

- **Crop Type**: Fescue pasture
- **Recommended PAN Loading (lb/acre)**: 50

<table>
<thead>
<tr>
<th>Date (mm/dd/yr)</th>
<th># of Loads Per Field</th>
<th>Weight of Loads (tons)</th>
<th>Total Weight (tons)</th>
<th>Weight Per Acre (tons/ac)</th>
<th>Waste Analysis PAN (lb/ton)</th>
<th>PAN Applied (lb/ac)</th>
<th>Nitrogen Balance (lb/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/4/96</td>
<td>60</td>
<td>8</td>
<td>480</td>
<td>17.8</td>
<td>4.2</td>
<td>74.8</td>
<td>75.2</td>
</tr>
<tr>
<td>6/12/96</td>
<td>50</td>
<td>8</td>
<td>400</td>
<td>14.8</td>
<td>4.2</td>
<td>62.2</td>
<td>13.0</td>
</tr>
</tbody>
</table>

**Crop Cycle Totals**: 32.6 lb/ac, 137.0 lb

**Owner’s Signature**: John A. Manurehauler

**Operator’s Signature**: John A. Manurehauler

**Certified Operator (Print)**: John A. Manurehauler

**Operator Certification #**: 9111

---

1. Can be found in operator’s manual for the spreader. Contact a local dealer if you do not have your owner’s manual.
2. See your animal waste management plan for sampling frequency. At a minimum, waste analysis is required within 60 days of land application events.
3. Enter the value received by subtracting column (7) from (B). Continue subtracting column (7) from column (8) following each application event.