UW-FARM
Field nutrient and Application Recommendation Manager

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UW-Madison
UW-FARM

- Manage on-farm, purchased nutrients
  - Best management practices
- ‘what if….’
  - Expand herd, feed more corn silage, feed less dietary P
  - Determine outcomes
  - Assess farm management to meet current/anticipated constraints
    - Environmental, equipment, land acquisition…
Program highlights

• Windows based
  – Field, animal management
• Soil test results/recommendations
• 2 manure sources, spreaders
• N or P based plan
• NRCS-590 alerts
• Manure, fertilizer application summaries
  – Speed for spreading
  – Combined fertilizer application rates
Current dairy operation

• 100 cows
  – 88 replacements

• 240 a cropland
  – 175 a alfalfa, 40 a corn silage
    • Need 10T forage/cow+replacement/yr
    • 75% alfalfa, 25% corn silage
  – Remaining 25 a as corn grain, pasture
### Farm Information

**Species:** Dairy

**Manure Source 1**
- Method: Not Incorp.

### Field Information

<table>
<thead>
<tr>
<th></th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>P2O5</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>K2O</td>
<td>8</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>S</td>
<td>0.8</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Manure analysis performed:**

### Spreader Source 1

- Dairy number
- lbs/day
- cu ft/day
- tons/year

<table>
<thead>
<tr>
<th>Description</th>
<th>number</th>
<th>lbs/day</th>
<th>cu ft/day</th>
<th>tons/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calves 150lbs</td>
<td>14</td>
<td>168</td>
<td>3</td>
<td>30.7</td>
</tr>
<tr>
<td>Yearlings 500lbs</td>
<td>30</td>
<td>1230</td>
<td>20</td>
<td>224.5</td>
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<tr>
<td>Breeding Heifers 750lbs</td>
<td>11</td>
<td>660</td>
<td>11</td>
<td>120.4</td>
</tr>
<tr>
<td>Bred Heifers 1000lbs</td>
<td>33</td>
<td>2706</td>
<td>44</td>
<td>493.8</td>
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<tr>
<td>Cows 1400lbs</td>
<td>100</td>
<td>11500</td>
<td>182</td>
<td>2098.8</td>
</tr>
</tbody>
</table>

- Confined during milking/feeding at night

### Dry Matter (%):

- 13

**Manure (tons):**

- Total: 2449
- Winter: 942

Actual total amount of manure may vary ±20%.

**Active farm:** Now
Farm Information

**Farm**
- Dairy

**Manure Source 1**

**Manure Source 2**

**Spreader Source 1**

**Spreader Source 2**

**Estimated Weight**

- **Spreader type:** Box spreader
- **Manure consistency:** solid

- **Spreader length (ft):** 8
- **Spreader width (ft):** 5
- **Sidewall height (ft):** 3
- **Manure height (ft):** 5

**Load capacity:** 4.5 tons

- **Estimated bulk density:** 45 lbs/cu ft
- **Actual bulk density**
**Crop Sequence** | **Yield Goal** | **Crop Nutrient Need** (P, K, N) | **Legume N** | **Fertilizer Credit** (P, K, N) | **Nutrients to Apply** (P, K, N)
---|---|---|---|---|---
Corn, silage | 20.1-25 tons | 160 40 70 | 0 | 0 0 0 | 160 40 70
Corn, silage | 20.1-25 tons | 160 40 70 | 0 | 0 0 0 | 160 40 70
Alfalfa seeding | 1-3 tons | 0 10 50 | 0 | 0 0 0 | 0 10 50

**Soil Test Results**

No lime application is required.

**Crop Sequence** | **Very Low** | **Low** | **Optimum** | **High** | **Very High** | **Excessive**
---|---|---|---|---|---|---
Corn, silage
Corn, silage
Alfalfa seeding
Rotation pH

**View Comments** | **View Adjusted Averages** | **Print Summary**
<table>
<thead>
<tr>
<th>Field</th>
<th>Crop</th>
<th>N</th>
<th>P205</th>
<th>K20</th>
<th>N</th>
<th>P205</th>
<th>K20</th>
<th>Loads</th>
<th>Rate</th>
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<tbody>
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<td>crn, sil</td>
<td>160</td>
<td>40</td>
<td>70</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>flat</td>
<td>crn, gm</td>
<td>160</td>
<td>55</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>south</td>
<td>alfalfa</td>
<td>0</td>
<td>30</td>
<td>125</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
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**Note:** Nitrogen credit includes legume and manure credits.

**Balance for:** (not balanced)

- Manual
- N
- P205
- N & P205
- K20
- Available
- Winter Amount

**Manure Information**

- Spreader: 1
- Capacity: 4.5 tons
- Total
  - Available: 2449
  - Remaining: 2449
- Winter
  - Available: 942
  - Remaining: 942

**Print Summary**

**Active plan:** nowconf

**Delete**
### Nutrient Plan

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<thead>
<tr>
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<th>Crop</th>
<th>N</th>
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<th>K20</th>
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<th>P205</th>
<th>K20</th>
<th>Loads</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>north</td>
<td>crn, sil</td>
<td>160</td>
<td>40</td>
<td>70</td>
<td>160</td>
<td>160</td>
<td>427</td>
<td>474</td>
<td>53.5</td>
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<tr>
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<td>crn, gm</td>
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<td>55</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td>70</td>
<td>21</td>
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<td>0</td>
</tr>
</tbody>
</table>

*Note: Nitrogen credit includes legume and manure credits.*

### Manure Information

- **Spreader:** 1
- **Capacity:** 4.5 tons

**Available:** 2449 Total: 942 Winter: 942
**Remaining:** 1 Total: 0

### Settings

**Active plan:** nowconf

**Balance for:** Available

- Manually adjust loads applied
- Manually adjust applied rate

**Print Summary**
### Nutrient Plan

**Plan Settings**

- **Manure Summary**
- **Fertilizer Summary**
- **Manure Value**

### Nutrient Plan Details

<table>
<thead>
<tr>
<th>field</th>
<th>acres</th>
<th>slope</th>
<th>loads</th>
<th>rate</th>
<th>speed</th>
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<tr>
<td>flat</td>
<td>15</td>
<td>0</td>
<td>70</td>
<td>21</td>
<td>3.3</td>
</tr>
</tbody>
</table>

*Note: Calculations valid only for box end and tank spreaders.*

*Speeds restricted to 0.5 - 5.5 mph.*

- **Unload time (seconds):** 240
- **Spreader pattern width (ft):** 8

*Actual unload times and spread pattern can be used for box end or tank spreaders for equipment specific estimates.*

- **View Speed Estimates Table**
- **Print Summary**

**Active plan:** nowconf

**Delete**
### Nutrient Plan

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<th>K2O</th>
</tr>
</thead>
<tbody>
<tr>
<td>north</td>
<td>Corn, silage</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>flat</td>
<td>Corn, grain</td>
<td>97</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>south</td>
<td>Alfalfa</td>
<td>0</td>
<td>30</td>
<td>125</td>
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<td>250</td>
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</tbody>
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**Note:** Additional starter may be needed for row crops.

### Combined App (lbs/acre)

<table>
<thead>
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<th>K2O</th>
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<td>97</td>
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<td>Alfalfa</td>
<td>0</td>
<td>30</td>
<td>250</td>
</tr>
</tbody>
</table>

**Note:** Click column headers to sort by column.
What if.....expand herd?

• 500 cows
  – plus 442 replacements
    • Manure = 14976 T
    • 30 T available N @ 4 lbs/T
    • Acres corn = 375 @ 160 lbs/a
  – No replacements
    • Manure = 10494 T
    • 21 T available N @ 4 lbs/T
    • Acres corn = 260 @ 160 lbs/a
What if….feed more corn silage?

• More DM from corn silage/a than alfalfa
  – If expand to 500 cows + replacements
    • 75% corn silage @ 20 T/a = 625 a
    • 25% alfalfa @ 5 T/a = 300 a
  – If no replacements on farm
    • Reduce forage needs/ acres by 50%
    • Have 21 T available N, need 25 T
    • New alfalfa acres remain similar to current

• Increase acres for manure N
What if…..feed less dietary P?

• Reducing diet P to NRC guidelines has potential to reduce manure P by 25%
• No replacements
  – Feed ‘excess’ diet P
    • @ 3 lbs $P_2O_5/T = 16$ T crop available $P_2O_5$
  – Feed less diet P
    • @ 2 lbs $P_2O_5/T = 10.5$ T crop available $P_2O_5$
  – Current crop needs = 5.4 T $P_2O_5$
• Cropping strategy for P-based plan
**UW-FARM**

- ‘what if….’ allows producers to identify potential agronomic and regulatory impacts of modernization options
  - Meet current or anticipated constraints proactively
- Microsoft Windows beyond 3.x
- Internet Explorer 4.01 (SP2) installed
- [http://uwlab.soils.wisc.edu](http://uwlab.soils.wisc.edu)
  - Download or request CD