How to read a UW farm soil report

Robert Florence
Lab Director
Soil and Forage Analysis Lab
Marshfield, WI
Introduction

Use a Wisconsin Dept. of Agriculture, Trade and Consumer Protections (DATCP) certified lab.

Recommendations are based off University of Wisconsin publication Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin A2809.
Information

### Soil Test Report

#### Nutrient Recommendations

**Corn:**
- Low: 131-150 lb
- Optimum: 151-170 lb
- Excessive: 171-190 lb
- Maximum: 190+ lb

**Soybean:**
- Low: 45-65 lb
- Optimum: 66-85 lb
- Excessive: 86-105 lb
- Maximum: 106+ lb

**Alfalfa, seeding:**
- Low: 1-2.5 t
- Optimum: 2.6-5 t
- Excessive: 5.1-7.5 t
- Maximum: 7.6+ t

**Alfalfa, established:**
- Low: 0-300 lb
- Optimum: 301-600 lb
- Excessive: 601-900 lb
- Maximum: 901+ lb

**Recommended N Application Rates for Corn (Grain) at Different Corn Price Ratios**

<table>
<thead>
<tr>
<th>Price Ratio</th>
<th>N-Corn Price Ratio ($/t N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85</td>
<td>125</td>
</tr>
<tr>
<td>0.15</td>
<td>110</td>
</tr>
</tbody>
</table>

**Guidelines for Choosing an Appropriate N Application Rate:**

1. If there is more than 50% of N applied as a starter fertilizer, use the upper end of the range.
2. For corn grown on medium and fine textured soils, the mid to low of the profitable range is the most appropriate.
3. For N applied as a starter fertilizer, use the upper end of the range.
4. For medium to fine textured soils, use the mid to low end of the range.
5. For corn grown on medium and fine textured soils with less than 2% organic matter, use the upper end of the range.
6. For corn grown on medium and fine textured soils, the mid to low end of the range is the most appropriate.

**ADDITIONAL INFORMATION**

- Time recommendation may not achieve desired pH in 3 years. Retest and apply as recommended.
- Recommended N rates are the total amount of N to apply (N-P-K), including starter fertilizer.
- This soil should be monitored more closely because it has a relatively low pH and a high exchange capacity.
- Starter fertilizer (e.g. 100-200 lbs N, K, P, Ca, Mg, etc.) is advisable for row crops on soils low in organic matter.

**Year 1:** If corn is harvested for silage instead of grain, apply extra 90 lbs K per acre to next crop.

**If alfalfa will be maintained for more than three years, increase recommended K by 20% each year.

### Test Interpretation

**Crop:**
- Corn
- Soybean
- Alfalfa, seeding
- Alfalfa, established
- Rotation

**Laboratory Analysis**

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Cu</th>
<th>Zn</th>
<th>Mn</th>
<th>Mg</th>
<th>K</th>
<th>Sulfate</th>
<th>Silicon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer</td>
<td>6.0</td>
<td>1.9</td>
<td>34</td>
<td>128</td>
<td>200</td>
<td>100</td>
<td>56</td>
</tr>
<tr>
<td>Commercial Fertilizer</td>
<td>6.0</td>
<td>1.9</td>
<td>34</td>
<td>128</td>
<td>200</td>
<td>100</td>
<td>56</td>
</tr>
</tbody>
</table>

- **Fertilizer Analysis**
- **Commercial Fertilizer Analysis**
Check that your information is correct.

Lime recommendations are based on plow depth, crop rotation, and soil type.

N rate adjustments are based on previous crop, soil series, county, irrigation, and tile drainage.

P and K nutrient recommendations are based on soil type.
**Nutrient Recommendations**

**P, K, and lime Recommendations**

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### Nutrient Recommendations

#### Cropping Sequence

<table>
<thead>
<tr>
<th>Crop Sequence</th>
<th>Very Low</th>
<th>Low</th>
<th>Optimum</th>
<th>High</th>
<th>Very High</th>
<th>Excessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soybean, grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa, seedling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa, established</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Soil Test Report

**NUTRIENT RECOMMENDATIONS**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Corn</th>
<th>Soybean</th>
<th>Alfalfa, seedling</th>
<th>Alfalfa, established</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>131-150 lb</td>
<td>46-55 lb</td>
<td>2-2.5 ton</td>
<td>4-6.5 ton</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>K</td>
<td>40</td>
<td>35</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**P, K, and lime Recommendations**

- **P**
  - 0-40 lb
  - 0-50 lb
- **K**
  - 0-40 lb
  - 0-50 lb
- **lime**
  - 0-300 lb

**Guidelines for Choosing an Appropriate Application Rate for Corn (ppg)**

1. If there is more than 50% residue cover at planting, use the upper end of the range.
2. For small grains grown on medium and fine textured soils, the mid to upper end of the probable range is the most appropriate.
3. If 100% of the N will come from organic sources, use the lower end of the range.
4. For medium and fine textured soils with 0% or more organic matter, use the lower end of the range.
5. For high organic matter, use the upper end of the range.
6. For corn following small grains or medium and fine textured soils, the middle to upper end of the range is most appropriate.

**Additional Information**

- Lime recommendation may not achieve desired pH in 3 years. Reseed then apply as recommended.
- If lime has been applied in the last two years, more lime may not be needed due to incomplete reaction.

**Starter fertilizer (e.g., 40-200 lbs N-P2O5-K2O/acre)**: advisable for row crops on soils slow to warm in the spring.

**Year 1**
- Corn: 180 pounds of nitrogen (N) per acre to the next crop.
- Alfalfa: 150 pounds of nitrogen (N) per acre to the next crop.

**TEST INTERPRETATION**

- **Laboratory Analysis**
  - **Sodium** (mg/kg)
  - **Calcium** (mg/kg)
  - **Phosphate** (mg/kg)
  - **Potassium** (mg/kg)
  - **Magnesium** (mg/kg)
  - **Iron** (mg/kg)
  - **Boron** (mg/kg)
  - **Magnesium** (mg/kg)
  - **Copper** (mg/kg)

**Recommended based on UW-Extension publication: Nutrient Application Rate Guidelines for Field, Vegetables, and Forage Crops in Wisconsin (2016)**
Nutrient Recommendations

<table>
<thead>
<tr>
<th>Cropping Sequence</th>
<th>Yield Goal</th>
<th>Crop Nutrient Need</th>
<th>Fertilizer Credit</th>
<th>Nutrients to Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>P₂O₅</td>
<td>K₂O</td>
</tr>
<tr>
<td>Corn, grain</td>
<td>131-150 bu</td>
<td>see below</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Soybean, grain</td>
<td>46-55 bu</td>
<td>0</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>Alfalfa, seeding</td>
<td>1-2.5 ton</td>
<td>30</td>
<td>0</td>
<td>105</td>
</tr>
<tr>
<td>Alfalfa, established</td>
<td>4.6-5.5 ton</td>
<td>0</td>
<td>0</td>
<td>300</td>
</tr>
</tbody>
</table>

The lime required for this rotation to reach pH 6.8 is 12 T/acre of 60-69 lime or 9 T/acre of 80-89 grade lime.

Nutrient needs – Based off soil test values and crop removal rates

Fertilizer credits – From previous crop or manure applications

Nutrients to apply – Difference between nutrient needs and fertilizer credits
Given in lbs. of N, P₂O₅ or K₂O equivalents / acre

Lime requirement – To the most limiting crop in rotation
Based off current pH, buffer pH, and target pH
Given in Tons/acre of 60-69 or 80-89 grade lime
# Nitrogen Rates

## Information

### P, K, and lime Recommendations

### N rates

## Soil Test Report

**Samples Analyzed By:** UW Soil & Plant Analysis Lab
8425 Mineral Point Road
Verona, WI 53593

**LAB #:** 13246
**Date:** 9/1/2011
**Time:** 8:56 AM
**Processed:** 9/1/2011

### Nutrient Recommendations

<table>
<thead>
<tr>
<th>Crop &amp; Stubble</th>
<th>Yield Goal (bu/acre)</th>
<th>N Rate (Fert. N)</th>
<th>P Rate (Fert. P)</th>
<th>K Rate (Fert. K)</th>
<th>Lime Rate (Fe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, grain</td>
<td>13.150</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Soybean, grain</td>
<td>16.05</td>
<td>0</td>
<td>35</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa, seedling</td>
<td>2.75</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Alfalfa, established</td>
<td>4.6-5.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Suggested N application rates for corn (grain) at different N corn price ratios*

<table>
<thead>
<tr>
<th>Medium/Low Yield Potential Soils</th>
<th>N Corn Price Ratio ($/bu N)</th>
<th>N Rate (Fert N)</th>
<th>Rate</th>
<th>Rate</th>
<th>Rate</th>
<th>Rate</th>
<th>Rate</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0.05</td>
<td>125</td>
<td>0.10</td>
<td>100</td>
<td>90-125</td>
<td>85</td>
<td>70-95</td>
<td>70</td>
</tr>
<tr>
<td>Medium</td>
<td>0.10</td>
<td>110</td>
<td>0.15</td>
<td>99.5</td>
<td>90-115</td>
<td>95</td>
<td>85-100</td>
<td>80</td>
</tr>
</tbody>
</table>

**Additional Information**

- Lime recommendation may not achieve desired pH in 5 years. Rest and apply as recommended.
- Recommended rates are the total amount of nutrients to apply (N+P+K), including starter fertilizer.
- This soil should be monitored more closely because it has a relatively low potassium buffering capacity.
- Starter fertilizer (e.g., 14-0-24) is advisable for crops on soils slow to warm in the spring.
- Year 1: If corn is harvested for silage instead of grain apply extra 90 lb K2O per acre on next crop.
- Alfalfa will be maintained for more than three years, increase recommended K2O by 20% each year.

## Test Interpretation

### Chopping Sequence

- **Very Low**: No crop residue
- **Low**: Residue is less than 50%
- **Optimum**: Residue is 50-75%
- **High**: Residue is 75-100%
- **Very High**: Residue is 100%
- **Excessive**: Residue is more than 100%

### Laboratory Analysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Soil</th>
<th>P-reducible</th>
<th>P-fixed</th>
<th>Olsen P</th>
<th>Residual N</th>
<th>Ammonia N</th>
<th>Nitrate N</th>
<th>Total N</th>
<th>Plant Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended based on UW Extension publication, "Nitrogen Application Rate Guidelines for Field, Vegetable, and Forage Crops in Wisconsin." (2006)*

For more information on the new N application rate guidelines for corn see http://uwsoils.wisc.edu/pubs/4079/

**Form for Copy**

*University of Wisconsin-Extension*
### Nitrogen Rates

#### Suggested N Application Rates for Corn (Grain) at Different N:Corn Price Ratios

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>N:Corn Price Ratio ($/lb N:$/bu)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td>Rate¹ Range</td>
<td>Rate¹ Range</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn, Forage legumes, Leguminous vegetables, Green manures³</td>
<td>125 110-140</td>
</tr>
<tr>
<td>Soybean, Small grains⁴</td>
<td>110 90-125</td>
</tr>
</tbody>
</table>

¹ Rate is the N rate that provides the maximum return to N (MRTN). Range is the range of profitable N rates that provide an economic return to N within $1/a of the MRTN.  
² These rates are for total N applied including N in starter fertilizer and N used in herbicide applications.  
³ Subtract N credits for forage legumes, leguminous vegetables, green manures and animal manures. This includes 1st, 2nd and 3rd year credits where applicable. Do not subtract N credits for leguminous vegetables on sand and loamy sand soils.  
⁴ Subtract N credits for animal manures and 2nd year forage legumes.  

Guidelines for choosing an appropriate N application rate for corn (grain):  
1) If there is more than 50% residue cover at planting, use the upper end of the range.  
2) For small grains grown on medium and fine textured soils, the mid to low end of the profitable range is the most appropriate.  
3) If 100% of the N will come from organic sources, use the top end of the range. In addition, up to 20 lb N/a in starter fertilizer may be applied in this situation.  
4) For medium and fine textured soils with 10% or more organic matter, use the low end of the range; for medium and fine textured soils with less than 2% organic matter, use the high end of the range.  
5) If there is a likelihood of residual N, then use the low end of the range or use the high end of the range and subtract preplant nitrate test (PPNT) credits.  
6) For corn following small grains on medium and fine textured soils, the middle to low end of the range is most appropriate.  

For more information on the new N application rate guidelines for corn see [http://uwlab.soils.wisc.edu/pubs/MRTN/](http://uwlab.soils.wisc.edu/pubs/MRTN/)

For crops other than corn grain and wheat, a single N rate is given.
Information

P, K, and lime Recommendations

N rates

Comments
Important notes on:
- lime and nutrient applications
- Alternatives one may choose
- Note on rotational considerations
- Can save you time and money so please read
Test Results

Information

P, K, and lime Recommendations

N rates

Comments

Test results
Test Results

Graph: Soil test P and K levels for each crop
Rotation pH

Table: Raw result values
Questions?

Robert Florence
Rflorence@wisc.edu
715-387-2523 x 13

Lab Director
UW- Soil and Forage Analysis Lab
2611 Yellowstone Dr.
Marshfield, WI 54449