Evening One Agenda

Make the most of what you have  Improve or change what you have
Make the most of what you have

- What do I have?
  - Species
  - Soil type
  - Soil fertility

- What do I do with it?
  - Improve fertility
  - Improve cutting management
Would you keep it?

Why or why not?
Make the most of what you have

• Know what species you have
  – Look for the good stuff
  – Can you manage it to be more productive?
  – Tailor your management to what you have

• Planting new takes resources and incurs a risk
  – If you aren’t managing what you have now what you plant new may become what you have
  – Can you establish and manage a new seeding?
Grass

• Includes grasses and grass-like plants, sedges, rushes and lilies

• 1 Cotyledon or seed leaf - monocot

• Growing point internal-whorl

• Parallel leaf veins

• No secondary growth – no branching
Orchardgrass
- Leaf sheaths and stems flattened
- Leaf crossection is V shaped
Orchardgrass
- Bunch grass
- Scattered winterkill in NYS
Orchardgrass
- Early maturing grass
Timothy
- Bunch grass
- Round stemmed
Timothy
Tall Fescue

- Stiff leaved grass almost plastic-like
- Bunch grass but has rhizomes so may fill in slowly
Tall Fescue
Perennial Ryegrass
Reed canarygrass
Reed canarygrass
• Wide Leaf
• Grows best with lots of soil moisture
Reed canarygrass - Sod forming
• Rhizomes

Reed Canarygrass

• Large ligule
Smooth bromegrass
- Has distinctive $M$ or $W$ constriction in leaf
- Rhizomes, forms a sod
Quackgrass
Quackgrass
Meadow Foxtail
Bluegrass
Legume

- Dicot
  - Two leaf seedling
  - Leaf veins net like
  - New growth can come from new buds in above ground portion of plant
- Seed in pod
- Roots have nodules
  - Use an inoculant
White Clover
Alsike Clover
Birdsfoot Trefoil
Evening One Agenda

✓ What do I have?
  ✓ Species
  ❏ Soil type
  ❏ Soil testing

❏ What do I do with it?
  ❏ Improve fertility
  ❏ Improve cutting management
Soil

- Typically half solid and half space
- Pores about equally contain air and water
- Nutrients held on solids
- Plant available nutrients are in soil solution (water)
Sands  Loams  Clay

- **Good**
  - water drains away
  - roots need air
  - warm up early in the spring

- **Bad**
  - water drains away
  - less organic matter
  - don’t hold nutrients

- **Good**
  - hold moisture
  - holds nutrients
  - higher organic matter

- **Bad**
  - hold moisture
  - slow to warm up in the spring
Know your soil types

• Soils have a specific soil name (soil series)
• Named based on the local it was found in
• Will tell you drainage class
• Need for Cornell specific nutrient recommendations
Where you can obtain

- Local Soil and Water Conservation District office and
- Natural Resources Conservation Service office
- Soil Survey books
- http://websoilsurvey.nrcs.usda.gov/app/
Welcome to Web Soil Survey (WSS)

Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation’s counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Soil surveys can be used for general farm, local, and wider area planning. Onsite investigation is needed in some cases, such as soil quality assessments and certain conservation and engineering applications. For more detailed information, contact your local NRCS office.
## Herkimer County, New York, Southern Part
### (NY615)

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BoC</td>
<td>Bombay very fine sandy loam, 8 to 15 percent slopes</td>
<td>0.4</td>
<td>0.5%</td>
</tr>
<tr>
<td>CsB</td>
<td>Conesus silt loam, 2 to 8 percent slopes</td>
<td>2.9</td>
<td>3.8%</td>
</tr>
<tr>
<td>FaC</td>
<td>Farmington silt loam, 0 to 8 percent slopes</td>
<td>16.2</td>
<td>21.4%</td>
</tr>
<tr>
<td>HtA</td>
<td>Hornell silt loam, 0 to 3 percent slopes</td>
<td>2.3</td>
<td>3.0%</td>
</tr>
<tr>
<td>HyC</td>
<td>Hudson silt loam, loamy substratum, 8 to 15 percent slopes</td>
<td>3.2</td>
<td>4.2%</td>
</tr>
<tr>
<td>RbA</td>
<td>Rhinebeck silt loam, loamy substratum, 0 to 3 percent slopes</td>
<td>1.0</td>
<td>1.3%</td>
</tr>
<tr>
<td>WaA</td>
<td>Wassaic silt loam, 0 to 3 percent slopes</td>
<td>6.4</td>
<td>8.4%</td>
</tr>
<tr>
<td>WaB</td>
<td>Wassaic silt loam, 3 to 8 percent slopes</td>
<td>30.3</td>
<td>40.0%</td>
</tr>
<tr>
<td>WaC</td>
<td>Wassaic silt loam, 8 to 15 percent slopes</td>
<td>9.6</td>
<td>12.7%</td>
</tr>
<tr>
<td>WaD</td>
<td>Wassaic silt loam, 15 to 25 percent slopes</td>
<td>3.5</td>
<td>4.7%</td>
</tr>
</tbody>
</table>

**Totals for Area of Interest**: 75.8 100.0%
Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.05 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: Low (about 4.0 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: C
Evening One Agenda

✓ What do I have?
  ✓ Species
  ✓ Soil type
  ❑ Soil testing

❑ What do I do with it?
  ❑ Improve fertility
  ❑ Improve cutting management
If you use no fertilizer or manure this year will your crops still grow?
How much from the soil?

• Don’t care!
• Experience
• Soil Testing
  — has its limitations
  — as good as info you provide
Take samples to plow depth or 5-6 inches

Take representative samples throughout the field

Take one composite sample for analysis
<table>
<thead>
<tr>
<th>CNAL Bag No.</th>
<th>SAMPLE ID</th>
<th>Other Tests</th>
<th>Sample Date</th>
<th>Soil Name REQUIRED</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tillage Depth</th>
<th>Artificial Drainage</th>
<th>% Legume last yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please write 1, 2, 3, or 4 (1 = no till, 2 = 1-7 inches, 3 = 7-9 inches, 4 = greater than 9 inches)</td>
<td>Please write 1, 2, 3, or 4 (1 = None, 2 = Inadequate, 3 = Adequate, 4 = Excellent)</td>
<td>Please write 1, 2, 3 or 4 (% Legume 1 = 0% 2 = 1-25% 3 = 26 - 50% 4 = 51-100%)</td>
</tr>
<tr>
<td>Past year crops</td>
<td>Future Crops</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>3 yrs ago</td>
<td>This yr</td>
<td></td>
</tr>
<tr>
<td>2 yrs ago</td>
<td>Next yr</td>
<td></td>
</tr>
<tr>
<td>Last yr</td>
<td>Third yr</td>
<td></td>
</tr>
</tbody>
</table>
### Perennial Agronomic Crops

<table>
<thead>
<tr>
<th>CODE</th>
<th>Initial Establishment - pre-plant</th>
<th>CODE</th>
<th>Topdressing Established Stands</th>
<th>CODE</th>
<th>Initial Establishment</th>
<th>CODE</th>
<th>Topdressing Established Stands</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALE</td>
<td>Alfalfa</td>
<td>ALT</td>
<td>Alfalfa</td>
<td>CVE</td>
<td>Crownvetch</td>
<td>CVT</td>
<td>Crownvetch</td>
</tr>
<tr>
<td>AGE</td>
<td>Alfalfa-grass</td>
<td>AGT</td>
<td>Alfalfa-grass</td>
<td>GRE</td>
<td>Grasses</td>
<td>GRT</td>
<td>Grasses (brome, timothy)</td>
</tr>
<tr>
<td>ABE</td>
<td>Alfalfa-trefoil-grass</td>
<td>ABT</td>
<td>Alfalfa-trefoil-grass</td>
<td>GIE</td>
<td>Grass-intensive management</td>
<td>GIT</td>
<td>Grass-intensive management</td>
</tr>
<tr>
<td>BTE</td>
<td>Birdsfoot-trefoil</td>
<td>BTT</td>
<td>Birdsfoot-trefoil</td>
<td>PIE</td>
<td>Pasture-rotation grazed</td>
<td>PIT</td>
<td>Pasture-intensive management</td>
</tr>
<tr>
<td>BGE</td>
<td>Birdsfoot-trefoil-grass</td>
<td>BGT</td>
<td>Birdsfoot-trefoil-grass</td>
<td>PGE</td>
<td>Pasture w/improved grasses</td>
<td>PNT</td>
<td>Pasture w/invasive grass</td>
</tr>
<tr>
<td>BCE</td>
<td>Birdsfoot-trefoil-clover</td>
<td>BCT</td>
<td>Birdsfoot-trefoil-clover-grass</td>
<td>PLE</td>
<td>Pasture w/legumes</td>
<td>PGT</td>
<td>Pasture w/improved grass</td>
</tr>
<tr>
<td>CLE</td>
<td>Clover</td>
<td>CLT</td>
<td>Clover</td>
<td>WPB</td>
<td>Waterways, Pond, Dike</td>
<td>PLT</td>
<td>Pasture w/legumes</td>
</tr>
<tr>
<td>CGE</td>
<td>Clover - grass</td>
<td>CGT</td>
<td>Clover - grass</td>
<td>WPT</td>
<td>Waterways, Pond, Dike</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Annual Agronomic Crops

<table>
<thead>
<tr>
<th>CODE</th>
<th>CROP</th>
<th>CODE</th>
<th>CROP</th>
<th>CODE</th>
<th>CROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSP</td>
<td>Barley-spring</td>
<td>BUK</td>
<td>Buckwheat</td>
<td>RYF</td>
<td>Rye-cover crop</td>
</tr>
<tr>
<td>BSS</td>
<td>Barley-spring w/legume</td>
<td>COG</td>
<td>Corn-grain</td>
<td>RYS</td>
<td>Rye-seed production</td>
</tr>
<tr>
<td>BM</td>
<td>Barley-winter</td>
<td>COS</td>
<td>Corn-silage</td>
<td>SOG</td>
<td>Sorghum-grain</td>
</tr>
<tr>
<td>BWS</td>
<td>Barley-winter w/legume</td>
<td>MIL</td>
<td>Millet</td>
<td>SOF</td>
<td>Sorghum-forage</td>
</tr>
<tr>
<td>BDR</td>
<td>Beans-dry</td>
<td>OAT</td>
<td>Oats</td>
<td>SSH</td>
<td>Sorghum sudangrass hybrid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OAS</td>
<td>Oats seeded w/legume</td>
<td>SUD</td>
<td>Sudangrass</td>
</tr>
</tbody>
</table>

### Miscellaneous Crops - Results only. No interpretations or nutrient guidelines will be provided for IDL or OTH crop codes.

<table>
<thead>
<tr>
<th>CODE</th>
<th>CROP</th>
<th>CODE</th>
<th>CROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDL</td>
<td>Idle Land</td>
<td>OTH</td>
<td>Crops not listed</td>
</tr>
</tbody>
</table>

**OPTIONAL TESTS, Results only. No interpretations will be provided for optional tests. (Please enclose check for the total cost of all tests requested)**

- (836) pH in 0.01M CaCl₂: $5.00
- (837) Soluble salts: $5.00
- (838) No-till pH (0-1 inch): $5.00
- (861) Nitrate (PSNT) (840): $6.00
- Boron (Hot water): $10.00

Note: Heavy metal and cation exchange capacity (CEC) testing are available through the Cornell Nutrient Analysis Lab (CNAL). Please contact CNAL directly at 1-607-255-4540, scotttest@cornell.edu or http://cnal.cats.cornell.edu
<table>
<thead>
<tr>
<th>Past year crops</th>
<th>Future Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 yrs ago</td>
<td>This yr</td>
</tr>
<tr>
<td>2 yrs ago</td>
<td>Next yr</td>
</tr>
<tr>
<td>Last yr</td>
<td>Third yr</td>
</tr>
</tbody>
</table>
**Example 1**

<table>
<thead>
<tr>
<th>Element</th>
<th>lbs/acre*</th>
<th>Very Low</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus (P)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>138</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>3,209</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>268</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>Element</th>
<th>Value</th>
<th>Element</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil pH</td>
<td>5.7</td>
<td>Manganese (Mn), lbs/acre</td>
<td>28.2</td>
<td>% OM</td>
<td>6.1</td>
</tr>
<tr>
<td>Buffer pH</td>
<td>5.6</td>
<td>Zinc (Zn), lbs/acre</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron (Fe), lbs/acre</td>
<td>10.4</td>
<td>Aluminum (Al), lbs/acre</td>
<td>97.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop History (1 = last year, etc.)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Grasses Maintenance</td>
</tr>
<tr>
<td>2</td>
<td>Grasses Maintenance</td>
</tr>
<tr>
<td>1</td>
<td>Grasses Maintenance</td>
</tr>
</tbody>
</table>

**Sample Information Summary**

- Soil Name: Valsa
- Tillage Depth: 1 - 7 inches
- Drainage: Not Specified
- % Legume: Not Specified
- Crop Code: GRT
- Type: Pre-Plant

**Soil Fertilizer Recommendations (1= current yr, 2= next yr, etc.)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
<th>Lime</th>
<th>N Range</th>
<th>P205 Range</th>
<th>K2O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grasses Maintenance</td>
<td>3.00</td>
<td>50 - 75</td>
<td>40</td>
<td>30.00</td>
</tr>
<tr>
<td>2</td>
<td>Grasses Maintenance</td>
<td>0.00</td>
<td>50 - 75</td>
<td>40</td>
<td>30.00</td>
</tr>
<tr>
<td>3</td>
<td>Grasses Maintenance</td>
<td>0.00</td>
<td>50 - 75</td>
<td>40</td>
<td>30.00</td>
</tr>
</tbody>
</table>

**Comments**
- Improve yield and plant quality as well as protect the environment with proper fertilization.

* Morgan analysis results reported in pounds per acre

Nutrient recommendations provided by Cornell University. For assistance interpreting your report, contact your local Cooperative Extension office at 607-534-5841 or http://coe.cornell.edu/Pages/Default.aspx for a complete list of Cornell Cooperative Extension offices.

Nutrient recommendations provided by Cornell University.

These are general comments. Always consult with your crop adviser for recommendations specific to your farm.

Y1 Lime rate is for 100% EW. To calculate actual rate, rate to use = recommended rate/EW (of lime source) x 100.
<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>Element</th>
<th>Value</th>
<th>Element</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus (P)</td>
<td>2</td>
<td>Manganese (Mn)</td>
<td>28.2</td>
<td>% OM</td>
<td>6.1</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>138</td>
<td>Zinc (Zn)</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>3,209</td>
<td>Aluminum (Al)</td>
<td>97.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>268</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lab Results

Crop History (1 = last year, etc.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Grasses Maintenance</td>
</tr>
<tr>
<td>2</td>
<td>Grasses Maintenance</td>
</tr>
<tr>
<td>1</td>
<td>Grasses Maintenance</td>
</tr>
</tbody>
</table>

Soil Fertilizer Recommendations (1 = current yr, 2 = next yr, etc.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
<th>Lime</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grasses Maintenance</td>
<td>3.00</td>
</tr>
<tr>
<td>2</td>
<td>Grasses Maintenance</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>Grasses Maintenance</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Fertilizer recommendations

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University. For assistance interpreting your report, contact your local Cooperative Extension office at 607-334-5841 or http://cve.cornell.edu/Pages/Default.aspx for a complete list of Cornell Cooperative Extension offices.

These comments are general. Always consult with your crop adviser for recommendations specific to your farm.

Yr1 Lime rate is for 100% ENV. To calculate actual rate: rate to use = recommended rate/ENV (of lime source) x 100.

Management Recommendations

Lime recommendation
**Crop History (1 = last year, etc.)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Grasses Maintenance</td>
</tr>
<tr>
<td>2</td>
<td>Grasses Maintenance</td>
</tr>
<tr>
<td>1</td>
<td>Grasses Maintenance</td>
</tr>
</tbody>
</table>

**Sample Information Summary**

- **Soil Name**: Valois
- **Tillage Depth**: 1 - 7 Inches
- **Drainage**: Not Specified
- **% Legume**: Not Specified
- **Crop Code**: GRT
- **Type**: Pre-Plant

**Soil Fertilizer Recommendations (1 = current yr, 2 = next yr, etc.)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
<th>Lime (tons/acre)</th>
<th>N Range (lbs/acre)</th>
<th>P2O5 Range (lbs/acre)</th>
<th>K2O (lbs/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grasses Maintenance</td>
<td>3.00</td>
<td>50 - 75</td>
<td>40</td>
<td>30.00</td>
</tr>
<tr>
<td>2</td>
<td>Grasses Maintenance</td>
<td>0.00</td>
<td>50 - 75</td>
<td>40</td>
<td>30.00</td>
</tr>
<tr>
<td>3</td>
<td>Grasses Maintenance</td>
<td>0.00</td>
<td>50 - 75</td>
<td>40</td>
<td>30.00</td>
</tr>
</tbody>
</table>

**Comments** - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University. For assistance interpreting your report, contact your local Cooperative Extension office at 607-334-5841 or http://cce.cornell.edu/Pages/Default.aspx for a complete list of Cornell Cooperative Extension offices.

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**Yr1 Lime rate is for 100% ENV. To calculate actual rate: rate to use = recommended rate/ENV (of lime source) x 100.**
<table>
<thead>
<tr>
<th>tons / acre</th>
<th>Ibs / acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lime</td>
<td>N Range</td>
</tr>
<tr>
<td>3.00</td>
<td>50 - 75</td>
</tr>
</tbody>
</table>

Yr1  Lime rate is for 100% ENV. To calculate actual rate: rate to use = recommended rate/ENV (of lime source) x 100.
Example 2

<table>
<thead>
<tr>
<th>Element</th>
<th>lbs/acre*</th>
<th>Very Low</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus (P)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>183</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>3,216</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>260</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>Element</th>
<th>Value</th>
<th>Element</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil pH</td>
<td>5.9</td>
<td>Manganese (Mn), lbs/acre</td>
<td>28.7</td>
<td>% OM</td>
<td>5.5</td>
</tr>
<tr>
<td>Buffer pH</td>
<td>5.7</td>
<td>Zinc (Zn), lbs/acre</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron (Fe), lbs/acre</td>
<td>24.6</td>
<td>Aluminum (Al), lbs/acre</td>
<td>91.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop History (1 = last year, etc.)

Year | Crop |
--- | --- |
3   | Corn-Stage |
2   | Corn-Stage |
1   | Clover-Grass Seeding |

Sample Information Summary

- Soil Name: Red Hook
- Tillage Depth: 1 - 7 inches
- Drainage: Not Specified
- % Legume: 50% - 100% Legume
- Crop Code: CGT
- Type: Maintenance

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
<th>Lime</th>
<th>N Range</th>
<th>P205 Range</th>
<th>K2O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clover-Grass Maintenance</td>
<td>2.00</td>
<td>0</td>
<td>40</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>Clover-Grass Maintenance</td>
<td>0.00</td>
<td>0</td>
<td>40</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>Clover-Grass Maintenance</td>
<td>0.00</td>
<td>0</td>
<td>40</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Morgan analysis results reported in pounds per acre

Nutrient recommendations provided by Cornell University. For assistance interpreting your report, contact your local Cooperative Extension office at 607-334-5841 or http://coe.cornell.edu/Pages/Default.aspx for a complete list of Cornell Cooperative Extension offices.

Nutrient recommendations provided by Cornell University.

These are general comments. Always consult with your crop advisor for recommendations specific to your farm.

YR1 Lime rate is for 100% EW. To calculate actual rate, rate to use = recommended rate/EW (of lime source) x 100.
<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
<th>Tillage Depth</th>
<th>% Legume</th>
<th>Crop Code</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clover-Grass Seeding</td>
<td>1 - 7 Inches</td>
<td>50% - 100%</td>
<td>CGT</td>
<td>Maintenance</td>
</tr>
<tr>
<td>2</td>
<td>Corn-Silage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Corn-Silage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Soil Fertilizer Recommendations (1= current yr, 2= next yr, etc.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop</th>
<th>Lime</th>
<th>N Range</th>
<th>P2O5 Range</th>
<th>K2O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clover-Grass Maintenance</td>
<td>2.00</td>
<td>0</td>
<td>40</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>Clover-Grass Maintenance</td>
<td>0.00</td>
<td>0</td>
<td>40</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>Clover-Grass Maintenance</td>
<td>0.00</td>
<td>0</td>
<td>40</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

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Yr1 Lime rate is for 100% ENV. To calculate actual rate: rate to use = recommended rate/ENV (of lime source) x 100.
Evening One Agenda

✔ What do I have?
  ✔ Species
  ✔ Soil type
  ✔ Soil testing

☐ What do I do with it?
  ☐ Improve fertility
  ☐ Improve cutting management
Improving pH - Lime

• Apply lime and nutrients to soil test recommendations

• Lime recommendations is based on lime with 100% ENV (Effective Neutralizing Value)

• Example:
  – If lime ENV is 75% and you need 3 ton of lime how many tons do you apply:
  – 3 ton ÷ .75 = 4 tons to be applied
Improving Fertility – Adding Plant Nutrients

• Use fertilizer and/or manure

• Example: If you need 75 lbs N, 40 lbs P$_2$O$_5$ and lbs 30 K$_2$O per acre, what fertilizer do you buy?
  – Go to fertilizer dealer and tell them to mix you the fertilizer you need
  Or
  – Use a known analysis like 19-19-19 and apply the pounds that get you close
Improving Fertility –
Adding Plant Nutrients (continued)

• Example
  – If you need 75 lbs N, 40 lbs P$_2$O$_5$ and lbs 30 K$_2$O per acre, what fertilizer do you buy?
  – Go to fertilizer dealer and tell them to mix you the fertilizer you need

Or
  – If you need 75 lbs N, 40 lbs P$_2$O$_5$ and lbs 30 K$_2$O per acre, what fertilizer do you buy?
Thoughts on fertility...

• Lack of nitrogen fertilization is one reason why grasses still tend to be under appreciated
  – Reason for “I don’t get any second cutting”
  – Nitrogen can raise protein and lower fiber levels

• Is field grass or legume
  – Decide which it is, don’t view as a mix
  – Fertilize accordingly
Nitrogen

- Typically need 50 lbs actual N for every ton of anticipated dry matter yield
- Can be combo with manure to achieve desired N.
- You may not be able apply enough manure to supply nitrogen for intensive management
- Why you may need to consider having legumes in the stand which produce their own N and give some off for grasses
Nitrogen

• For grasses in an intense 3-4 cutting system you need 200 - 225 of actual N in applications spread out over the summer.

• Example (lbs actual N): 100 lbs at green up in the spring, 50 lbs after 1\textsuperscript{st} cutting and 50 lbs after 2\textsuperscript{nd}.

• Less intense for hay may not apply any in spring but apply after first cutting to stimulate second cutting growth.
Cutting for quality

• Quality of feed comes from when you cut; plant maturity
• How much quality do you need?
  – What animals are you feeding
  – What animal performance do you need
• Tend to use NDF (Neutral Detergent Fiber) as quality indicator:
  – Less is More: Less fiber means more energy
  – But for optimal plant and animal performance tend to shoot for an optimal NDF level
Desired % NDF at feed out given a pure stand:

<table>
<thead>
<tr>
<th>Species</th>
<th>Desired % NDF</th>
<th>Alfalfa height to achieve desired % NDF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass</td>
<td>50</td>
<td>15-17</td>
</tr>
<tr>
<td>Alfalfa-grass</td>
<td>44</td>
<td>22-23</td>
</tr>
<tr>
<td>50-50 mix</td>
<td>44</td>
<td>22-23</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>40</td>
<td>28-30</td>
</tr>
</tbody>
</table>
Best Indicator of Alfalfa NDF Status in the Field

Begin cutting when alfalfa is 28 – 30 inches
Best Indicator of Grass NDF Status in the Field

• Begin cutting grass when nearby alfalfa is 15-16 inches tall
Can I just measure the grass?

<table>
<thead>
<tr>
<th>Species</th>
<th>Desired % NDF</th>
<th>Grass height to achieve desired % NDF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orchardgrass</td>
<td>49-50</td>
<td>19-20</td>
</tr>
<tr>
<td>Reeds</td>
<td>49-50</td>
<td>21-22</td>
</tr>
<tr>
<td>Canarygrass</td>
<td>49-50</td>
<td></td>
</tr>
</tbody>
</table>

Gets you close still not as good as alfalfa
June 15
Best Indicator of Alfalfa/Grass NDF Status in the Field

• Assumes 50% mix
• Begin cutting when alfalfa in the field is 23-24 inches tall
When Using Alfalfa Height as Indicator of NDF and When to cut

- Works across grass species
- Still not sure about subtle differences in N fertility and species maturity
- Start with grassiest fields first
For this system to work...

• The alfalfa needs to be in the same field or at same elevation close by

• Fields need to be even mix across field. Reality!: mostly alfalfa in well drained areas and grass in the poorly drained

• Your harvest and handling system will need to be able to capture the difference.
Grass Regrowth

• Type of regrowth: culms = stems
  – Regrowth culmless: tall fescue, orchardgrass, bluegrass
  – Regrowth culmed: reed canarygrass, smooth bromegrass
  – Regrowth culmed reproductive: timothy, perennial ryegrass
Apical Dominance

Growth is dominated by growing point at the tip of stem or root. Removal allows new buds to form and grow.

- **Strong**
  - Timothy
  - Smooth Bromegrass

- **Intermediate**
  - Orchardgrass
  - Reed Canarygrass
  - Tall Fescue

- **Weak**
  - Perennial Ryegrass
  - Kentucky Bluegrass
Tall grasses

- Orchardgrass, timothy, tall fescue, smooth bromegrass, reed canarygrass
- Do not graze, mow or clip closer than 3 inches, reserves and new growth are in the stubble
- With the exception of orchardgrass will not tolerate frequent grazing or cutting
Summary

- Know what you have
  - Species
  - Soils and Soil Fertility
- Manage your hay crop to make the most of it, reseed only as needed
- Cut timely to achieve the quality that you need