Growing quality hay

Andy H Smith
Grange Co-Op Supply
A healthy hay stand
Soil nutrient supply

- Soil nutrients must be present in a balance that satisfies plant requirements.
- Deficiencies of any one nutrient can lead to imbalances which will limit yield and crop quality.
Understanding soil tests and soil PH

How soil pH affects availability of plant nutrients

<table>
<thead>
<tr>
<th>Soil pH</th>
<th>Strongly Acid</th>
<th>Medium Acid</th>
<th>Slightly Acid</th>
<th>Very Slightly Acid</th>
<th>Slightly Alkaline</th>
<th>Medium Alkaline</th>
<th>Strongly Alkaline</th>
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<tbody>
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<td>NITROGEN</td>
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<td>COPPER AND ZINC</td>
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Optimum soil pH range: 6.2 - 7.3
Soil samples

• A soil test can provide an estimate of the soils nutrient supplying capacity
• Small field areas can be sampled as a composite
• Sample in a pattern that represents the entire field
• Take notice of areas in field that have distinct soil types and yields and any growth problems
• Some areas may need to be sampled separate
PH

- Soil PH is a measure of the acidity and alkalinity in soils
- PH levels range from 0 to 14, with 7 being neutral
- The optimal PH range for most crops is between 6.1 to 6.9, which is slightly acid
- PH reading measures active acidity
- Buffer PH indicates potential acidity
- Buffer PH is a measurement of the amount of hydrogen ions that needs to be replaced and neutralized by liming
- The higher the buffer Ph the less lime required
- Liming charts are based on a plow depth of 8 inches
- Liming of established hay fields is slow to realize benefits
- If possible aeration of established hay fields before lime applications, will produce quicker and better results.
The basics of fertilizer

<table>
<thead>
<tr>
<th>MAJOR NUTRIENTS</th>
<th>MINOR NUTRIENTS (TRACE ELEMENTS)</th>
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<tbody>
<tr>
<td>Carbon (C)</td>
<td>Molybdenum (Mo)</td>
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<tr>
<td>Hydrogen (H)</td>
<td>Copper (Cu)</td>
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<tr>
<td>Oxygen (O)</td>
<td>Boron (B)</td>
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<tr>
<td>Nitrogen (N)</td>
<td>Manganese (Mn)</td>
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<tr>
<td>Phosphorus (P)</td>
<td>Iron (Fe)</td>
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<tr>
<td>Potassium (K)</td>
<td>Chlorine (Cl)</td>
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<td>Sulphur (S)</td>
<td>Nickel (Ni)</td>
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<tr>
<td>Calcium (Ca)</td>
<td>Zinc (Zn)</td>
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<td>Magnesium (Mg)</td>
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</table>
Fertilizer almost always pays

• Simple math when hay prices are high, will aid in the decision to fertilize

• Spending $50.00 dollars to produce 1 extra ton of hay, when if you had to buy that ton for $100.00 make sense.
Understanding what you will need

- Determine the crops nutrient demand
- Project the crop yield
- Take into consideration the history of the field
- How old is the stand, is the PH in a desirable range
- Is there weed populations and if so can they be controlled?
- Are there rodent populations?
- Past fertilizer applications and past yield
- Yield can be no greater then allowed by the most limiting growth factor
- Moisture will determine the upper limit of yield
Nutrient removal and replacement

• Nitrogen is the main nutrient needed by grass and certain grass-legume mixtures
• Nitrogen will increase crude protein content of grass stands
• Phosphorus and potassium aid in new root development, building of new cell walls, energy metabolism and conversions, and development of new enzyme systems
Average nutrient removal by grass hay per ton

- Nitrogen – 40 pounds of actual N per ton
- Potassium – 60 pounds of Potash
- Phosphorus – 13 pounds of Phosphoric acid
- Sulfur – 5 pounds of S
Grass seed types for hay and pasture

- **Orchard grass** – Newer varieties outperform older choices. Varieties can be chosen for maturity times. Some varieties are suitable for dry land plantings. Bunchgrass
- **Brome species** – Meadow Brome and Smooth Brome are rhizomatous and both can be used in dry land applications. Alaska and California Bromes are a bunchgrass, quick to establish
- **Tall Fescues** – Newer varieties chosen for higher palatability. Very adaptable to wet soils and to dry soils. Bunchgrass. Very durable species.
- **Perennial Ryegrass** – Very quick to establish. Excellent palatability and yields. Bunchgrass. Good choice for over-seeding
- **Annual Ryegrass** – Fast growing high yielding used for temporary pasture or hay. Can be used as a cover crop with perennial grass to aid in establishment
- **Italian Ryegrass** – Bi annual bunchgrass. Can be planted with grain for hay, then grazed after cutting
- **Creeping Meadow Foxtail** – very rhizomatous grass that does well in low bottom and wet areas. Seed head resembles Timothy
- **Timothy** - Primarily used for horse hay. Not tolerant of heavy grazing. Bunchgrass
Clover seed types for hay and pasture

- **White Clover** – Stoloniferous clover that mixes well with grass. If managed, will improve grass in grazing systems.
- **Subterranean Clover** – Winter annual that reseeds itself if managed. Can be suitable for dry land applications.
- **Red Clover** – Biennial that can be used in crop rotations or green manure.
- **Strawberry Clover** – Stoloniferous. Good choice for wet areas.
- **Alsike Clover** – short lived perennial. Good choice for wet areas.
- **Berseem Clover** – Spring seeded with upright growth, can be used in a green chop blend or in a hay crop mixed with Barley, Peas and oats.
Do not over graze
Thank you.