HAY QUALITY AND GRASSY WEED MANAGEMENT

Current Topics in Farm and Forest Health
December 14, 2017
Ken Hart, Lewis County Extension
208-937-2311 or khart@uidaho.edu
HAYFIELD FERTILITY

• Better results begin with good information.
• Most important information is current soil condition.
• A proper soil test will provide the best parameters of current soil condition.
• Sampling tools, soil bags, and submission forms available a county Extension office.
WHAT INFORMATION DOES A SOIL TEST PROVIDE?

- Soil Organic Matter
- pH and salts
- Soil nutrient content
- Other information such as soil texture or fertilizer recommendations
HOW OFTEN SHOULD I TAKE A SOIL SAMPLE?

- Prior to seeding a crop in new ground
- At least every three years for established perennial crops
- Frequently enough to make good decisions on fertilization
HOW TO TAKE A SAMPLE

First select the site. Your soil sample should represent only one soil type or soil condition.
Each sample should consist of sub-samples taken from about 15 locations within the same soil type or sampling area.
SOIL CORE VARIABILITY

Mean: 44  STD: 48

Core number

Soil test P (Bray-I, lbs./acre)

Core number
INCREASING ACCURACY BY DIVIDING FIELDS BASED ON KNOWN VARIABILITY

Core number

Soil test P (Bray-I, lbs./acre)

Old manure piles

Feeding areas

Pasture

Overall Mean: 44, STD: 48
Pasture mean: 20, STD: 17
Feeding area mean: 114, STD: 52
HOW TO TAKE A SAMPLE

Use the “slice” method for a representative sample.

A soil probe is a good tool for collecting samples.
SOIL TEST RESULTS

• What do my soil test results mean?
• What nutrients do plants need?
• How can I supply those nutrients?
SOIL ORGANIC MATTER (OM)

Living or dead plant and animal residue
Measured in percent
OM content is highly variable
Generally, 3% to 8%
OM content is good for plants
PH
Indicates relative acidity or alkalinity
pH 7 = neutral; less than 7 = acid; more than 7 = alkaline or basic

The pH Scale

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

stomach acid
lemon juice
vinegar
milk
pure water
blood
milk of magnesia
ammonia

Acidic  [H+]  Basic
SOIL PH AND NUTRIENTS

Widest part of the bar indicates maximum availability

Adapted from www.soil.ncsu.edu
NUTRIENT MANAGEMENT GOALS

• Meet crop nutrient needs
• Maintain soil quality
• Conserve resources
• Protect water quality -- reduce leaching and runoff risk
MACRONUTRIENTS

N = nitrogen
P = phosphorus
K = potassium
Ca = calcium
Mg = magnesium
S = sulfur
MICRONUTRIENTS

Fe = iron
Mn = manganese
Zn = zinc
B = boron
Mb = molybdenum

Ni = nickel
Cu = copper
Co = cobalt
Cl = chlorine
QUESTIONS TO ASK YOURSELF BEFORE YOU ADD FERTILIZER:

1. Which elements do I need? (N, P, K, S, Ca)
2. How much do I apply?
3. What type of material do I use?
4. Which application method is best?
5. When is the best time to apply it?
TYPES OF FERTILIZERS

- Chemical fertilizers
- Organic fertilizers (bone meal, compost, manure, etc.)
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Dry Matter Concentration</th>
<th>Removal per ton of hay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>2.0 % N</td>
<td>40 lb N</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.0 % K₂O</td>
<td>60 lb K₂O</td>
</tr>
<tr>
<td>Phosphate</td>
<td>0.65 % P₂O₅</td>
<td>13 lb P₂O₅</td>
</tr>
<tr>
<td>Sulfur</td>
<td>0.25 % S</td>
<td>5 lb S</td>
</tr>
</tbody>
</table>

- In grazed pastures, 85 to 90% of nutrients returned in manure and urine.
- Uneven distribution of nutrients in grazed pastures.
- Test hay fields annually, pastures every 3 years.
### Nitrogen for Grass and Grass-Legume Mixes

<table>
<thead>
<tr>
<th>Stand Composition</th>
<th>Yield Potential</th>
<th>Nitrogen Recommendation (lbs/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% grass</td>
<td>1-2 tons/acre</td>
<td>50</td>
</tr>
<tr>
<td>75% grass, 25% legume</td>
<td>2-4 tons/acre</td>
<td>75</td>
</tr>
<tr>
<td>50% grass, 50% legume</td>
<td>4-6 tons/acre</td>
<td>25</td>
</tr>
<tr>
<td>25% grass, 75% legume</td>
<td>6-8 tons/acre</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>-------------------------</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

- Yield potential ranges are approximate and can vary based on environmental conditions.

- Nitrogen recommendations are based on soil test results and can be adjusted as needed.
HAYFIELD WEED MANAGEMENT
BE A GRASS FARMER FIRST!

Grass management is more fun than weed management.
WHY A PROBLEM?
Weeds compete for:
▪ space
▪ water
▪ nutrients
▪ light

Control takes time/$

In a pasture, serious weed problems almost always indicate management deficiency.

When is direct action advised?
➢ New invaders
➢ Poisonous plants
➢ Perennial weeds
➢ The war is lost!
INTEGRATED WEED MANAGEMENT

Scouting – On the ground management

- Gates
- Water
- Feed bunks
- Bedding area
- Fences
- Right of way
<table>
<thead>
<tr>
<th>Weed</th>
<th>Seed/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild oat</td>
<td>250</td>
</tr>
<tr>
<td>Canada thistle</td>
<td>680</td>
</tr>
<tr>
<td>Shepardspurse</td>
<td>38,500</td>
</tr>
<tr>
<td>Redroot pigweed</td>
<td>117,000</td>
</tr>
<tr>
<td>Russian thistle</td>
<td>500,000</td>
</tr>
</tbody>
</table>
# WEED PERSISTENCE

<table>
<thead>
<tr>
<th>Weed</th>
<th>Yrs viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quack grass</td>
<td>1-6</td>
</tr>
<tr>
<td>Wild oat</td>
<td>4-7</td>
</tr>
<tr>
<td>Field bindweed</td>
<td>20+</td>
</tr>
<tr>
<td>Canada thistle</td>
<td>21</td>
</tr>
<tr>
<td>Redroot pigweed</td>
<td>40</td>
</tr>
</tbody>
</table>
WEED MANAGEMENT STRATEGIES

Prevention
Mechanical Control
Cultural Control
Biological Control
Chemical Control
Roots and Seeds in:
- equipment
- seed, transplants
- manure and compost
- hauled top-soil
MECHANICAL CONTROL

• Tillage
• Mowing
• Flooding
• Burning
• Mulching
• Hand weeding
CULTURAL CONTROL

Healthy pastures are more competitive!
- Proper nutrition/soil health

Minimize weed access to nutrients?
- Hard to do once established

Crop rotation
- Establish pasture after a broadleaf crop

Nurse/companion crops
- Clovers produce N, but limit herbicide options
BIOLOGICAL CONTROL

Health soils promote crops
Insects/disease to control perennial weeds
- Canada thistle
  - root weevil, stem gall fly, seed head fly
- Rush skeletonweed
  - stem gall midge, bud gall mite, rust fungus
CHEMICAL CONTROL

➢ Phytotoxic chemicals
➢ Very effective
➢ Responsible and judicious use!!!
➢ Abuse and lose............
FACTORS INFLUENCING HERBICIDE PERFORMANCE

Environmental Influences
- Soil factors
  - adsorption, texture
- Climate factors
  - Temperature, precipitation, humidity, wind

Growth Stage Influences
- emergence - easiest to control
- vegetative
- flowering
- maturity - already set seed?
- fall regrowth
HERBICIDES REGISTERED FOR ANNUAL GRASSES

<table>
<thead>
<tr>
<th>System</th>
<th>Outrider</th>
<th>Plateau</th>
<th>Matrix Laramie</th>
<th>Landmark</th>
<th>Axiom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasture</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>X</td>
<td>X</td>
<td>X*</td>
<td>X*</td>
<td></td>
</tr>
<tr>
<td>Rights of Way</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hay</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

* Not grazed by livestock
## HERBICIDES REGISTERED FOR ANNUAL GRASSES

<table>
<thead>
<tr>
<th>System</th>
<th>Esplanade</th>
<th>Diuron + Metribuzin</th>
<th>Milestone</th>
<th>Amber&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Arrow 2EC Select, Envoy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasture</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>X*</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Rights of Way</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Not grazed by livestock

<sup>1</sup>cheatgrass, possibly ventenata
### HERBICIDES REGISTERED FOR ANNUAL GRASSES

<table>
<thead>
<tr>
<th>System</th>
<th>Fusilade</th>
<th>Glyphosate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasture</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Range</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Rights of Way</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hay</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
HERBICIDE OPTIONS

2,4-D
dicamba (Vanquish, Banvel)
2,4-D + dicamba (WeedMaster)
dicamba + diflufenzopyr (Overdrive)
triclopyr (Remedy)
2,4-D + triclopyr (CrossBow)
triclopyr + clopyralid (Redeem)
2,4-D + picloram (Grazon P+D)
fluroxypyr + picloram (Surmount)
fluroxypyr + triclopyr (Pasturegard)
diuron (Direx, Diuron)
metsulfuron (Cimarron)
metsulfuron + 2,4-D + dicamba (Cimarron MAX)
hexazinone (Velpar)
tebuthiuron (Spike)
paraquat (Gramoxone Extra)
glyphosate (Roundup UltraMax)
imazapic (Plateau)
SPECIAL PRECAUTIONS FOR HERBICIDES

Drift

▪ Particle Drift
▪ Vapor Drift

2,4-D Formulations - amine vs ester

Groundwater Protection

Contaminated Equipment - SU’s especially

Soil Residual Herbicides - sterilants !!!!!

Soil Persistence
• Make sure you can identify the weed
• Some products may require an applicators license to purchase/apply
• Read and follow label directions
• Pay close attention to REI
• Wear correct PPE