Pasture & Grazing Management

http://smallfarms.oregonstate.edu/pastures

Melissa Fery
OSU Extension Service
Small Farms Faculty
Benton, Lane and Linn Counties
Melissa.Fery@oregonstate.edu
541-730-3538
Characteristics of Overgrazed Pastures

- Grazers run out of feed before grazing season ends.
- See more ribs than rib-eyes.
- See more weeds than desirable plants.
- See more bare or open spaces grasses.
- See water ponding on soil surface.
- Gate and watering areas are trampled bare.
- Fence line is clean.
- Across the fence line is clean.
- Fence line posts leaning out (not prevailing winds!).
- You’re calling around for ‘cheap’ hay!
Get in the Grass Growing Business

- Community of plants we maintain to feed livestock
- Grass is a crop
  - Needs management
- Control grazing and resting of pasture
- Reduce soil compaction
  - Restricts root growth
  - Reduces water and nutrient uptake

http://sunnybrookstables.com/
What is the basic unit of a pasture/hay field community?

Tiller: it is composed of leaves, stem, nodes, internodes, apical meristem, intercalary meristem, axillary meristem, and roots.
Pasture Yield = \frac{\text{Number of Tillers}}{\text{Land Area}} \times \frac{\text{Weight}}{\text{Tiller}}
The Facts About Grass

- Grass needs energy for growth, maintenance, and reproduction.
- Green plants get energy from sunlight.
- Grass need leaves and stems to collect sunlight. **Leaf Area Index**
- Roots need the collected energy for growth and replacement.
How the Grass Plant Grows
Grazing Grasses

- Encourage rapid re-growth
- Protect lower portion of the plant
  - Protect the growing points
  - Energy is stored near the bottom and in roots
Grazing Height as a Guide

- Graze no lower than 3 to 4 inches!
- Animals LOVE the bottom 2 inches of grass, it’s like candy- stored energy- carbohydrates
- Graze again at 6 to 8 inches
Take half and leave half

<table>
<thead>
<tr>
<th>Percent leaf volume removed</th>
<th>Percent root growth stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>30%</td>
<td>0%</td>
</tr>
<tr>
<td>40%</td>
<td>0%</td>
</tr>
<tr>
<td>50%</td>
<td>2-4%</td>
</tr>
<tr>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>70%</td>
<td>78%</td>
</tr>
<tr>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>90%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Adapted from NRCS, Bozeman, MT
Grow Grass Grow!

- Key Growth Stages
  - Vegetative
  - Reproductive (Flowering)
- Graze to keep in vegetative stage
Major Pasture Growth Stages

Stage 1 = lag (slowest growth)
Stage 2 = log (fastest growth)
Stage 3 = senescence (growth largely stopped)
Stage 4 = death
View of Overgrazing: What really happens

- Extended lag
- Slow log
- Over-grazed
- Remove animals

Recovery depends on species, soils, timing, amount of sinning!
Regrown pasture – ready to graze again
Keeping Forage Quality High

- Graze, harvest or cut for hay, before seed heads are produced
- Compromise between yield and quality
  - Yield increases with time
  - Quality decreases with time
- Manage animals and grazing
Overstocking Leads to…

- Overgrazing
- Soil compaction
- Low productivity (need more hay!)
- Bare ground and then mud
- Loss of topsoil
- Nothing to hold or utilize nutrients
- Increased weeds
Overgrazing Happens--

in two ways:

1. Leaving animals in too long
2. Bringing them back too soon
## Grazing Habits

<table>
<thead>
<tr>
<th>Daily Activities on Pasture in Hours</th>
<th>Horse</th>
<th>Cattle</th>
<th>Sheep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grazing</td>
<td>14</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Standing</td>
<td>8</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Laying Down</td>
<td>1</td>
<td>9</td>
<td>11</td>
</tr>
</tbody>
</table>
Continuous Grazing

- Very common and easy
- Allows some animals to become highly selective
- Loss of desirable forages
- Increase undesirable grasses, weeds and erosion
- Only successful with large acreage and low stocking rates
Animals can be “Persuaded”

- With proper pasture and grazing management, animals can be persuaded to eat grasses they might choose to avoid otherwise.
- Requires ability to rotate animals into smaller pastures and/or mowing grass before it reaches maturity.
- Higher stocking rate on smaller pasture for a shorter period of time.
Rotational Grazing
Rotational Grazing

- Dividing larger pastures into smaller ones
- Allowing time for grass to rest before returning
- If just starting out, try dividing your pasture in \( \frac{1}{2} \).
- Ideally have at least 4 pastures that provide enough feed for 7 to 10 days.
- Water source for each pasture
Design Pastures Based on Landscape
Create a Sacrifice Area

- Pasture that is going to be “sacrificed to save the others!
  OR
- Small, non-irrigated, non-grazing areas
- Constructed with footing materials

AKA:
- Turnout, Corral, Paddock, Run, Holding pen
- So named because you sacrifice the grass here to save it elsewhere
  “Beat it up, and clean it up”
Improved Sacrifice areas must be MANAGED:

- Animals are kept here when soil is too wet
- Animals kept here whenever grass is dormant or not ready for re-grazing
- Feed hay and if possible, don’t feed on the ground
- Pick up manure
Composting Process

- Oxygen
- Moisture
- Ideal carbon to nitrogen ratio (30:1)
- Temperature (130-150 F)
Tips for Composting

- The more the pile is turned, the quicker it will compost (4 to 10 weeks)
- Could install perforated pipe in the middle of the pile to increase airflow
- Moisture content is important
  - Ideal 50 to 60%
  - Should feel like a wrung out sponge
  - Too wet or too dry - microbs may die
## Carbon to Nitrogen Ratios

<table>
<thead>
<tr>
<th>Material</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pig manure</td>
<td>7:1</td>
</tr>
<tr>
<td>Poultry manure</td>
<td>10:1</td>
</tr>
<tr>
<td>Coffee grounds</td>
<td>20:1</td>
</tr>
<tr>
<td>Grass clippings</td>
<td>12 to 25:1</td>
</tr>
<tr>
<td>Horse manure</td>
<td>25:1</td>
</tr>
<tr>
<td>Tree leaves</td>
<td>30 to 60:1</td>
</tr>
<tr>
<td>Straw</td>
<td>40 to 100:1</td>
</tr>
<tr>
<td>Wood chips/Sawdust</td>
<td>200 to 500:1</td>
</tr>
<tr>
<td>Wood</td>
<td>700:1</td>
</tr>
</tbody>
</table>

Making and Using Compost, University of Missouri Columbia
Multi-Species Grazing
# Livestock Preferences

<table>
<thead>
<tr>
<th></th>
<th>Horse</th>
<th>Cattle</th>
<th>Sheep</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass</td>
<td>90</td>
<td>70</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>Weeds</td>
<td>4</td>
<td>20</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Browse</td>
<td>6</td>
<td>10</td>
<td>10</td>
<td>60</td>
</tr>
</tbody>
</table>

% of diet
Large quantities of nutrients are removed from the soil when pastures are mechanically harvested. However, when pastures are grazed, 80%-90% of the soil nutrients used by pasture plants are cycled back to the soil from urine and manure.
Includes recommendations for major nutrients
Helps to interpret soil test results
Provides guidelines for pounds of nutrients to apply

Pastures
Western Oregon and Western Washington
J. Hart, G. Pirelli, L. Cannon, and S. Fransen

In western Oregon and Washington, forage shortages typically occur in late fall and early spring. In contrast, an excess supply may exist in late spring. By fertilizing in early fall and late winter, you can increase forage supply in deficient times. To reduce production in times of excess, reduce or eliminate late spring fertilization. A single fertilization program will not fit all pastures. Determine which combination of grazing management, fertilization, and irrigation fits your resources and environment. Use a soil test and an assessment of forage supply and forage carry to determine fertilization needs.

Soil pH indicates whether lime is needed, and the SMP buffer or lime requirement (LR) test estimates the amount of lime needed. Estimate the rate of lime application from the following SMP buffer table.

Table 1.—Lime application rates for grass or white clover-grass pastures.

<table>
<thead>
<tr>
<th>If the SMP buffer test for lime is:</th>
<th>Apply this amount of lime (t/a):</th>
</tr>
</thead>
<tbody>
<tr>
<td>under 5.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Basic Fertilizing Principles

- Nitrogen, Phosphorus, Potassium most limiting nutrients
- General guidelines for Nitrogen applications
  - 40 lb/acre in fall
  - 40 to 60 lb/acre in late winter
  - 40 to 60 lb/acre in early April
- Phosphorus (P₂O₅)
  - Apply in fall
  - Stable nutrient, doesn’t move in soil very much
  - Soil test to determine if soil P is rising
- Potassium (K₂O)
  - Apply in fall
  - Depletes rapidly with haying systems
  - Low levels reduce grass and clover vigor
- Sulfur (Sulfate)
  - Leaches from soil. Apply in the spring. About 20 lbs/acidres
Lime Applications to Pastures

- Average pH range in Western Oregon is 4.9 to 6.5
- pH of 6.5 recommended for white clover-grass pastures.
- pH of 5.5 or above recommended for subclover-grass pastures.
Forage grasses

- Cool season grasses
- 3 major forage producers
  - Orchardgrass
  - Ryegrass (endophyte free)
  - Tall Fescue (endophyte free)
- Native grasses
  - California oat grass
  - Blue wild rye
Many “weedy” grass species

- **Roughstalk Bluegrass**
- **Foxtail barley** *Hordeum jubatum*
- **Hedgehog dogtail** *Cynosurus echinatus*
- **Hare barley** *Hordeum murinum*
- **Squirrel Tail Fescue** *Vulpia bromoides*
- **Velvet Grass** *Holcus lanatus*
Legumes

- High in protein, highly digestible
  - Alfalfa
  - **Birdsfoot Trefoil**
  - Clovers
    - White
    - Subterranean
    - Red
- Fix nitrogen from the air
- Can reduce the need for nitrogen fertilizers
- More productive in the summer than grasses
- Potential bloat issues
Fall Management

- New roots are forming and need all the energy they can get
  - Grazing below 3 inches in the fall, 3 weeks of feed is lost in the spring
- Great time to sample soil and determine if fertilizer or lime is needed
Winter Grazing

- Limit grazing since grass isn’t actively growing
- Animals are off when soils are saturated
- Utilize sacrifice pasture or heavy use area
Mossy Pastures

- Symptom not the problem
  - Compacted/wet soils
  - Overgrazing
  - Low soil fertility
- Improve management
  - Create competition
- Expensive temporary band-aid
  - Ferrous ammonium sulfate or ferrous sulfate
Renovation

- Plan ahead
- Match plant species with soil conditions
- Fall planting (September-mid October)
- 6 weeks of growth before killing frost
- Don’t renovate all pastures at once
- Ask yourself, how did it get this bad? What am I willing to change?
It comes down to:

- Frequency
- Intensity
- Season
The Bottom Line

- For healthy pastures:
  - Be a grass farmer
  - Create multiple pastures for rotational grazing
  - Wintertime management is crucial
  - Manage manure resources
  - Renovate if needed
http://smallfarms.oregonstate.edu/pastures