Maintaining Healthy Pastures

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Lack of planning is planning for failure!

• Set realistic goals
  – Providing exercise area only
  – Supplementing purchased feedstuffs
  – Providing majority of animals’ feed requirements

• Determine pasture needs
  – Animal numbers, species, age, sex
  – Paddock design
  – Forage species selection
Goal: Provide Exercise Area

• Best choice if acreage is extremely limited
• Provides *fresh air*, relieves animal boredom
• Little or no forage will be present
• Dry, solid area is important
  – Use surface or tile drainage as necessary
  – Crushed limestone base 6-8 inches deep, over geotextile.
Goal: Supplement Purchased Feed

• Best choice is acreage available is marginal

• Take care not to overgraze

• Weather will dictate amount of time animals can spend on pasture

• Don’t feed hay in the pasture.
Goal: Provide Majority of Animals’ Feed

• Requires relatively large acreage or low animal numbers

• Requires several properly designed paddocks

• Requires a **MIG** system

—**Management Intensive Grazing** —
Pasture Carrying Capacity

- The maximum number of animal units per acre, while maintaining forage health & productivity.
  - Will depend on forage specie(s) present
  - Will depend on animal species grazing it
  - Will depend upon growing season environment
  - Will depend upon YOUR management skills!
Animal Units
A measure equal to 1000 lbs. live animal weight

<table>
<thead>
<tr>
<th>Class of Animal</th>
<th>Animal Unit Equivalent</th>
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<tbody>
<tr>
<td>Cow, 1000 lb, dry</td>
<td>0.92</td>
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<tr>
<td>Cow, 1000 lb, with calf</td>
<td>1.00</td>
</tr>
<tr>
<td>Cow, 1500 lb, with calf</td>
<td>1.50</td>
</tr>
<tr>
<td>Cattle, 1 year old</td>
<td>0.60</td>
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<tr>
<td>Bull, mature</td>
<td>1.35</td>
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<tr>
<td>Horse, mature</td>
<td>1.25</td>
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<tr>
<td>Sheep, mature</td>
<td>0.20</td>
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<tr>
<td>Goat, mature</td>
<td>0.15</td>
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<tr>
<td>Llama</td>
<td>0.20</td>
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<tr>
<td>Alpaca</td>
<td>0.15</td>
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<tr>
<td>Rabbits, Poultry</td>
<td>0.02</td>
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New Pasture Establishment
and/or
Old Pasture Renovation
Identify Limitations

• Is acreage adequate for animal numbers?
  – 2-3 acres/animal unit in continuous grazing system
  – 1 acre/animal unit in MIG system

• Access to the required equipment?
  – Tractors, tillage tools, seeders, mowers, etc.

• Financial resources?
  – Seed, fertilizer, fencing, herbicides, water systems

• Time
  – Yours
  – Your pasture’s
Evaluate Current Pasture Quality

• What forage species are present?
  – Grasses
  – Legumes

• What is sward quality and density?

• Are weeds present?
  – Broadleaf, grass, woody, poisonous
Get Off to a Good Start

• Much of the production potential has been determined when the seeder leaves the field.

• Short cuts taken prior to and at seeding often result in poor production.
Evaluate and Plan

• Drainage and soil characteristics
• pH and fertility levels
• Variety selection
• Seeding Method
• Previous crop and herbicides
• Potential weed problems
Establishment/Renovation Steps

- Test soil fertility levels 6–12 months in advance
- Fertilize based upon soil test results
- Kill competing vegetation
- Choose appropriate forage species
- Prepare and plant in the proper seedbed
- Pray for (moderate) rain!
- Control grazing
- Maintain fertility
- Control weeds
Soil Fertility Testing

• Collect 5 soil cores to make 1 composite sample for every 2.5 acres
• Soil cores must be taken to 7 inch depth
• Submit samples to lab for analysis
  – pH (acidity)
  – P (phosphorus)
  – K (potassium)
Fertilize Based Upon Soil Test

• Apply limestone 6-12 months prior to renovation
  – pH goals: 6.0 – 6.2 grass only
  6.2 – 7.0 legume or grass/legume

• Apply P & K prior to seeding
  – P₁ goal: 40 – 50 lbs./A
  – K goal: 250 – 300 lbs./A
Kill Competing Vegetation

• New establishment – kill all preexisting vegetation
  – Chemical herbicides
  – Tillage
• Renovation – keep existing forage grasses
  – Chemical spot-treatments
  – Woody brush – mechanical removal with chemical cut-stump treatments
Selecting Forage Species

• Grasses
  – Provide the bulk of the forage stand
  – Hardy, easier to maintain
  – Form sods, reduce erosion, keep animals out of the mud

• Legumes
  – Higher digestibility than grass
  – Higher in protein than grass
  – Provide nitrogen for the grass
  – Complement and improve grass pasture quality
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<tbody>
<tr>
<td>Kentucky bluegrass</td>
<td></td>
<td></td>
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<tr>
<td>Orchardgrass</td>
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<tr>
<td>Reed Conarygrass</td>
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<td>Alfalfa</td>
<td></td>
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<tr>
<td>Red clover</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>White clover</td>
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Comparison of pasture production and amount needed

- Amount produced
- Amount needed by a growing animal
- Amount needed by a milking animal

Pasture yield:
- April
- May
- June
- July
- August
- Sept.
- Oct.
- Nov.
Seeding Methods

• “Conventional”
  – Plow, disk, harrow, roll
  – Can seed by broadcasting or drilling

• “No-till”
  – Tills and seeds in one equipment pass
  – Requires specialized equipment
  – Reduces erosion potential from bare ground
  – Limits weed control options for existing vegetation
Seeding Methods

- Fall graze and reseed (trample reseeding)
- Fall graze and frost seed
Soil should be firm enough at planting for footprint to sink no deeper than 3/8 inch.
Brillion RollerSeeder

Direction of equipment

Seed hopper
Conventional Drill
No-till Drill
Pray for Rain!

• Too much or too little rainfall after seeding can cause establishment failure.
• Establishment can be done in Spring or Fall
  • Spring – as early as ground can be prepared
    – Don’t attempt much later than mid-April
  • Fall – around Sept. 1st is good time to seed
    – Cooler temps favor forage species over weeds
    – Chances of seasonal rainfall are better
    – Frost will eliminate annual weed competition
Control Grazing

• Allow forages time to become established
  – 70-80 day minimum establishment period
  – Light rotational grazing only during first year
  – Avoid heavy animal traffic until sod is well-formed, especially when ground is saturated

• Once established, use a MIG system to prolong pasture life and maintain maximum productivity
Maintain Fertility

• A well managed pasture requires little annual P & K fertilizer
  – 80% of nutrients are recycled through animal feces
  – Nutrients tend to accumulate in areas where animals loaf

• Annual nitrogen applications will increase grass yield and productivity
  – Maintaining a legume as 30% of the sward density will substitute for purchased N fertilizer
Continue to Control Weeds

- Weeds compete with forage, and may cause animal-related problems
- Control options
  - Herbicides (broadcast, spot-treatment)
  - Grazing management
  - Clipping between grazing intervals
- Never allow weeds to go to seed!
- Never feed supplemental hay in the pasture!
A dense, vigorous, healthy forage stand is your best weed control!
Forage Species Selection

- What’s there already?
- Intended use?
- Animal requirements?
- Environmental constraints?
- Management constraints?
Species Durability

Tolerance to Treading*
* (32 Sheep per acre)

% Reduction In Stand

Perennial Ryegrass 23
Ky Bluegrass 31
White Clover 60
Timothy 62
Orchardgrass 80
Red Clover 87

Edmond. 1964. NZ J. Ag Res.
Most Commonly Adapted Forages

• Cool Season Grasses
  – Tall fescue
  – Orchardgrass
  – Smooth bromegrass
  – Kentucky bluegrass
  – Perennial ryegrass
  – Timothy
  – Reeds canarygrass
  – Redtop

• Legumes
  – Alfalfa
  – Red clover
  – Ladino clover

• Warm Season Grasses
  – Native grasses
  – Sorghum-sudangrass
  – Pearl millet
Univ. of Kentucky study

• Two similar *orchardgrass* plants were chosen from greenhouse

• Both were managed the same for 6 months:
  – Clipped ~ once per month
  – Supplied with good fertility (N,P, K) and water
Overview

• **Left** plant *simulates continuous grazing*
  – Initially clipped to a 1 inch height
  – Then clipped weekly for the next 4 weeks at a 1 inch height

• **Right** plant *simulates rotational grazing*
  – Initially clipped to a 3.5 inch height
  – Then clipped again at 3.5 inches four weeks later

• Images taken at the beginning of the fifth week (day 29) for both plants
Day 1 (24 hours after clipping)

1” Continuous  3.5” Rotational
Day 2

1” Continuous  3.5” Rotational
Day 3

1" Continuous  3.5" Rotational
Day 4

1” Continuous  3.5” Rotational
Day 5

1” Continuous  3.5” Rotational
Day 6

1” Continuous  3.5” Rotational
Forage & Grazing Resources

• Management Intensive Grazing in Indiana

• Kentucky Forage Publications
  http://www.uky.edu/Ag/Forage/ForagePublications.htm

• Pastures for Profit – U. of Wisconsin
  http://www.learningstore.uwex.edu/assets/pdfs/A3529.pdf

• National Sustainable Agriculture Information Service
  https://attra.ncat.org/
Happy Grazing!