Managing Pasture Availability

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How much forage do you need?

How much forage do you have, right now?

How much forage are you going to have, tomorrow? next week? next month?

Forage Quantity versus Quality

Relative Quality vs Yield

As plants mature:
1) Increase mass
2) Increase hard-to-digest fractions (stem, cell wall, NDF)
3) Decrease readily digestible fractions (leaf, protein, sugar, starch)

Factors Influencing Forage Growth Rate and Accumulation

We can’t control the weather but we can predict likely trends in:
- Solar radiation and daylength
- Precipitation
- Temperature

These all add up to “seasonality of growth”

Factors Influencing Forage Growth Rate and Accumulation

- Some things we CAN control
  1) Defoliation management (frequency, intensity, stocking rate)
  2) Forage species and variety selection
  3) Nitrogen and other nutrients
  4) Irrigation
  5) Plant growth regulators

Stocking rate = animal per acre of total pasture per year.
SR is single most important factor in effective grazing management.
Individual animal gain and gain per acre are inversely related.
Stockpiling Forage

- Set aside pastures to accumulate mass for later grazing
- Stockpiling can be done at any time
- Stockpiling for fall/winter use is most effective in Michigan

- How to stockpile grasses for fall/winter use
  - Graze through mid-late July
  - Fertilize
  - Rest pasture for 60+ days
  - Resume grazing in October after growth has stopped
  - Use strip grazing to control utilization and reduce waste

- Any forage can be stockpiled, but quality of most declines sharply with duration of stockpiling time
- Some species retain quality better into the winter
  - Tall fescue
  - All brassicas, but especially rape and kale

Seasonal Yield Distribution of Michigan Forage Groups

Multiply % of yield by expected dry matter yield to calculate estimated forage availability in lb/acre

Forage Species and Variety Selection

Forage varieties differ in seasonal distribution
Increase Plant Diversity by Using Mixtures

- The classic perennial mix - grass + legume
- Growing diverse species helps insure that something will be actively growing over a longer time period
- Aim for a mixture of grasses and legumes with varying seasonality and tolerances for cool, hot, dry, wet, sunny, or shaded conditions
- Mixtures are more difficult to manage for precise nutritive value - components are inherently different - proportions change over time
- Grass-legume mixtures prevent use of most herbicides ... so, graze the "weeds" too

Use annual forages to extend and complement your perennial forage base

- Identify windows of opportunity, such as after corn silage, wheat, a failed seeding, or a pasture that is due for renovation
- 60-day window is long enough to harvest annual forages
- Grow annual forages on fertile, well-drained ground to take full advantage of their fast growth potential
- Schedule annual and perennial forage availability to meet your need for pasture biomass

Annual Forages for Spring Grazing

- Must be planted the year before, in July - October
- Might get some fall grazing in seeding year if planted early
- Annuals initiate spring growth a few weeks earlier than perennial grasses and green up sooner for early, high-quality pasture
- Small grains – rye, triticale, wheat - Potential yield 1.5 – 2.5 ton/acre in 1-2 harvests
- Italian ryegrass - Potential yield 2 – 4.5 ton/acre in multiple harvests - Better regrowth potential than small grains - Take care to buy a variety with cold tolerance suitable for Michigan

Annual Forages for Summer Grazing

- Plant brassicas, small grains, and peas Apr - May, ready to graze in 45-90 days
- Plant warm-season forage crops in warm soil, ready to graze in 45-60 days - > 60 F for corn, soybeans (April - May) - > 60 F for sorghum, sorghum-sudangrass, millet (May - June)
- Use brown-midrib varieties of corn and sorghums for better forage quality
- Potential yield 3 – 10 ton/acre for sorghums and corn
- Sorghums must be managed to reduce risk of prussic acid poisoning – do not graze when wilted, frosted, or when shoots are less than 18 inches long
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Annual Forages for Fall/Winter Grazing

- Plant late June – August, ready to graze in 45-60 days
- Later planting reduces growth rates, need more days until ready to graze
- Brassicas; small grains especially oats, rye, triticale; peas
  - Brassica flavor may taint milk, withdraw for 3 hr pre-milking
  - Brassicas should never be fed as the only forage because they are too low in effective fiber. Always provide hay, intercropped grass, or other forage.
  - Brassicas can be no-tilled into glyphosate-suppressed perennial award, which will recover the following year

Nitrogen

- Nitrogen fertilizer can stimulate plant growth rates ... but only IF water, temperature, and light are adequate
Nitrogen

- Time N application to help boost growth when forage is lacking
  - Be ready to use the extra forage 2 to 4 weeks after application
  - Avoid applying N when forage is likely to already be in excess of animal needs…UNLESS you plan to harvest and conserve the excess as hay, haylage, or balage

- Commercial slow release N fertilizers theoretically reduce losses and even out the N supply, but cost effectiveness for pasture is unproven

- Legume N is naturally slow release, 25 – 40% legume in stand is worth 50 – 150 lb N/acre

- Other soil nutrients (P, K, S, B) improve plant stress tolerance and persistence but they don’t drive large responses in growth

Plant Growth Regulators

- Foliar application of artificial plant growth regulators can influence forage growth patterns

  - Gibberelin (RyzUp SmartGrass)
    - Gibberelin hormone drives leaf extension and growth, but is low during cool weather (40-50 F)
    - Applying foliar gibberelin enhances rate and extent of cool weather leaf growth
    - Most useful to extend fall grazing season
    - No benefit shown during warm weather

  - Ethylene inhibitors (Bio-Forge)
    - Ethylene hormone increases under stress and speeds plant senescence
    - Diformyl urea suppresses excessive ethylene production and up-regulates antioxidant pathways
    - May improve stress tolerance and production of forages under stressful conditions
    - Currently being tested on alfalfa at MSU

All Farms: 3-Year Average Pasture Growth 2001 – 2003

- Ave. w/N 10,575 DM/A
- Ave. w/o N 8,125 lbs. DM/A
- 2,450 lb. DM/A increase w/N (31%)
- Cost $36/ton DM

RyzUp 50 applied in October, Michigan

- 40 units N x 2
- Urea @ $508/ton
- $44/A/yr

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