What’s to Know About Grazing Systems

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UMN Agronomy and NCROC
2010 MN Beef Cow/Calf Days

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FARM = Year-Round Forage System

- Well-managed pasture is at least 3X cheaper than home-grown/stored/fed hay!
- POTENTIAL = 7-8 months of pasture?
  - 4-5 months of conserved forage
  - Consider feeding hay a few weeks during summer to rest CS pastures and avoid lethal overgrazing
- Graze May 1 to Jan. 1? How?
  - Rotational grazing management
  - ‘SMORGASBORD’ of forages
Seasonal Distribution of Pasture Yield, Density, & Quality

• Pasture subdivision for rotational stocking is essential (NRCS assistance)
  – Rest
  – Residual height control (4” minimum!)

• Soil fertility
  – Stocking density
  – Testing and amendments
  – Supplementation
  – Winter feeding location

• Plant diversity: within and among fields
Pasture Smorgasbord CONCEPT

- Legume (Alfalfa, Kura Clover) - Grass 50%
- Mixed Grass + N (Manure) 20%
- Birdsfoot Trefoil-Grass (Summer Stkpld) 10%
- Native Perennial WSG? 5%
- Annuals (Cool and Warm, Renovation Year) 15%
CS Grasses: REST & RESIDUAL HEIGHT

• **SPRING** → **summer** → **fall?** growth curve

• Summer: need 3X! the rest period, so need 3X the pasture acreage (Voison’s *Grass Productivity*)

• Tendency: as pasture forage supply diminishes, rest and residual shorten – DETRIMENTAL to desirable species and yield!

• ~1/3-1/2 of acreage: Spring hay/haylage → summer/fall graze/stockpile

• Add other forage species to the system
Perennial CS Grasses: Drought

- Smooth bromegrass and quackgrass
  - Persistent, but poor/uneven production
- Kentucky bluegrass
  - Poor production
  - Symptom of over-grazing!
- Reed canarygrass is ‘king’
- Tall fescue (meadow fescue) and orchardgrass not bad
Tall and Meadow Fescue
Perennial Ryegrass in Ireland
1st Production-Year Perennial Ryegrass at St. Paul
Ryegrass and Festulolium Winter Injury at Grand Rapids, MN, Spring 2003
### Legumes vs. N fertilization of smooth brome pastures rotationally grazed by dairy cows (Morris, MN, 3-yr avg.)

<table>
<thead>
<tr>
<th>Pasture</th>
<th>N Applied</th>
<th>DM Yield</th>
<th>Cost of Forage Available</th>
<th>Cost of Forage Consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lb/ac/yr</td>
<td>Ton DM/ac</td>
<td>$/ton DM</td>
<td>$/ton DM</td>
</tr>
<tr>
<td>Smooth Brome</td>
<td>0</td>
<td>2.2</td>
<td>11.70</td>
<td>37.00</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>3.1</td>
<td>10.10</td>
<td>44.00</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>3.0</td>
<td>11.90</td>
<td>44.50</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>3.5</td>
<td>12.50</td>
<td>45.80</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>3.9</td>
<td>13.90</td>
<td>56.80</td>
</tr>
<tr>
<td>Alfalfa/Kura/Brome</td>
<td>0</td>
<td>5.3</td>
<td>5.50</td>
<td>18.30</td>
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</tbody>
</table>
Legumes: Drought Tolerance

- Alfalfa is the Queen
- Red clover OK
- White clover poor
- Birdsfoot trefoil: stockpile for summer
- Kura clover persists
Alfalfa

- Most drought-tolerant cool-season legume
- Needs good soil and drainage
- Mix with (sod-forming) grasses, can use some N fertilizer
- Yellow-flowered types (Falcata, ‘Spredor IV’)
  - Greater persistence
  - Later maturing, more fall-dormant
Stockpiled BFT for summer

- Holds quality with maturation and reseeds
- Mix with non-competitive grass
  - Timothy
  - NWSG?
- Graze early, then stockpile late spring-early summer growth for mid-late summer grazing
Why Kura Clover?

• Outstanding winter hardiness
• Broadly adapted
• Grazing tolerant
• High quality
• High animal performance
• Pasture sod base
• Haylage
• NCR-SARE grant
### 3-year-avg. Holstein steer performance on clover/grass pastures in southwestern WI (Albrecht, 2002)

<table>
<thead>
<tr>
<th>Clover-Grass Mixture</th>
<th>Grazing Days</th>
<th>Steer Days/ac/yr</th>
<th>ADG (lb/day)</th>
<th>Gain (lb/ac/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kura clover-grass</td>
<td>169</td>
<td>345</td>
<td>2.65</td>
<td>916</td>
</tr>
<tr>
<td>Red clover-grass</td>
<td>169</td>
<td>313</td>
<td>2.26</td>
<td>712</td>
</tr>
</tbody>
</table>
Stockpiling Perennial Grasses for Fall

• Initiate with N in late July
• Tall fescue (meadow fescue?) and orchardgrass best
• Smooth brome OK
• Grass-legume mixtures, too (graze 1st)
• STRIP GRAZE to stretch…
• And/or annual ryegrass stockpiled or swath-grazed – NCROC results
Small grains

• Nurse crop boosts seeding year yield

• August sowing for fall forage
  – WI work (Albrecht) – high quality!
  – Grazed, windrowed, or ensiled

• Early summer forage prior to summer seeding perennials
Italian Ryegrass in Stearns Co., Aug. 2004
WS Annual Grasses

- Need moisture to establish
- One-graze: Foxtail millets
- Multi-graze:
  - Sorghum-sudangrass (BMR)
  - Sudangrass
  - Pearl millet
- Corn
- Forage sorghum (BMR)
Native Perennial Warm-Season Grasses

- E.g. Big bluestem, switchgrass, Indiangrass
- It's what was here
- Short production window, but critical period
- Forage quality greatly undervalued
  - Very digestible fiber & high-quality protein
- Graze or hay-then-graze
- Tall residual height is essential
- Mix with cool-seasons? SDSU research
Pasture Smorgasbord CONCEPT

- **Mixed Grass + N (Manure)**: 20%
- **Legume (Alfalfa, Kura Clover) - Grass**: 50%
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- **Native Perennial WSG?**: 5%
- **Annuals (Cool and Warm, Renovation Year)**: 15%
Keys to Productive Pasture

• Grazing management
  – Variable REST
  – ‘NEVER’ overgraze
  – Rotational stocking – water and fence
• Pasture smorgasbord across farm
• Small-scale experimentation with species & mixtures on YOUR farm
• Stepwise renovation
  – Identify worst pasture(s) → winter feed → annuals → re-establish perennials