Today’s format

- If you haven’t already, please mute your microphones.
- Speakers will present for 30-40 minutes.
- Panelists will join the discussion at the end.
- Please ask questions through the chat function (located at the lower part of your screen).
- Although our “end time” is posted for 9:30 a.m., participants are welcome to remain longer if they want to discuss the topic further.
Jeff Davidson
KCARE Watershed Specialist for the Flint Hills

Panelists

Dale Helwig, Cherokee County Extension Agent;
Jody Holthaus, Meadowlark Extension District Agent;
Keith Harmoney, Agricultural Research Center, Hays;
Jaymelynn Farney, Southeast Research and Extension Center
Extending the Grazing Season

Using Cover Crops to fill in Forage Gaps

Jeff Davidson,
K CARE Flint Hills Watershed specialist
Agenda for Today

• What is the “perfect” cover crop
  • Incorporating cover crops for grazing
  • Grazing plan for cover crops
• Crop Residue
• Last Thoughts
The “perfect” cover crop

What are producers looking for?

• Highly diverse
• Deep, productive root system
• Utilizes available moisture efficiently
• Forms mycorrhizal relationship
• Doesn't require fertilizer
• Reseeds and/or regrows easily
• Drought resistant
• Benefits wildlife & pollinators
• Safe for grazing

What meets these requirements?
The “perfect” cover crop?
Root Growth

Grazing Affects on Grass Root Growth

- Root Growth vs. % Leaf Volume Removed

Take Half, Leave Half

80% removal = 12 days w/ no root growth
90% removal = 18 days w/ no root growth
Take Home

• Focus on forage growth, proper leaf removal, and adequate recovery which directly impacts the nutrient cycle, water cycle, and energy flow.
Agenda for Today

• What is the “perfect” cover crop
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• Last Thoughts
What cover crop is needed?

• What is the current forage base?
• Are there production or nutritional gaps in the current system?
• Is there available land to incorporate additional forages?
What is the current forage base?

Forage Growth Rate

CS Perennial (Smooth Brome, Tall Fescue)
What is the current forage base?

Forage Growth Rate

Feb Apr Jun Aug Oct Dec

WS Perennial (Native Grass)
Management Challenges

What is the current forage base?

CS Perennial (Smooth Brome, Tall Fescue)

Herd Demand

Forage Growth Rate

Feb Apr Jun Aug Oct Dec
Common Forage Base – East/Central Kansas
Filling Forage Gaps

- Rotating to cropland – Warm Season Annual
CRABGRASS – RYE/WHEAT

Crabgrass is warm-season annual
- Germinates 58°F
- Shallow seeding 2-5 lbs live seed/acre
- Can re-seed
  - Remove 2-3 weeks prior to first frost
- Slight disk in fall or spring
- 25 lbs DM/lb of Ntiogen applied
- Stocking rate 800 to 1200 lbs/acre fertility and water

Rye/wheat is cool-season annual
- Terminate crabgrass ~early August
  - Tillage most common but in no-till system hay
  - No-till may be better as want to have 100% ground cover and roots from crabgrass
- Plant September
- Terminate by hay/grazeout in April/May to allow crabgrass to see the sunlight

Stocking Rates

• Livestock Inventory – Calving Date (1200 lb cow)
Cover Crops for Grazing

• Maintain forage quality for livestock
• Allow rest for perennial forages
• Extend the grazing season
Grazing Cover Crops

What about November-February?
Grazing Cover Crops

- Year-Round Forage Balance Potential

- CS Perennial
- WS Perennial
- WS Annual
- CS Annual

Forage Growth Rate

Feb Apr Jun Aug Oct Dec
Forage or Supplement?

**SHORT TERM GRAZING**

Allow cows a couple of hours/d to graze high protein, high energy forage at least 3x/week
- This is also known as limit grazing pasture

**Oklahoma State University study**
- Allowed cows to graze wheat pasture for 4 hours 3x/week (Fall-calving herd)
- Rest of the time cows were on native hay
- From calving to weaning cows on this system performed exceptional

Same can be done with cover crops and stalks
Forage Production Options

• Summer Grazing (graze at 45-60 days after planting)
  – Warm season mix planted in May (replaces cash crop)
  – Warm season mix planted directly after wheat
• Fall Grazing (graze at 60-75 days after planting)
  – Warm and cool season mix after wheat harvest: plant August 1 to 15
  – Cool season mix after short season corn or corn silage planted by September 1 to 15.
• Spring Grazing:
  – Early spring: cereal rye or triticale planted by Nov. 1 previous fall
  – Mid-spring: winter wheat seeded previous fall
Cover Crop - Toxicity Potential

Forage Crops

Grazing Management: Toxic Plants

<table>
<thead>
<tr>
<th>Forage Crop Characteristics and Toxicities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
</tr>
<tr>
<td>Sorghum - Sudan grass</td>
</tr>
<tr>
<td>Sudangrass</td>
</tr>
<tr>
<td>Teff</td>
</tr>
<tr>
<td>Triticale</td>
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<tr>
<td>Wheat</td>
</tr>
</tbody>
</table>

MF3244 KSU Publication – April 2018
Take Home

• Determine the surpluses and deficits in the current forage base (quantity and quality).
• Determine growth gaps in the cash crop production cycle that would allow a cover crop to be grown.
• Plant species to meet current needs that will grow in identified growth windows. In some instances, current cropping systems could be changed to allow a window of opportunity.
Take Home

• Be aware of potential toxicity issues with the forage types you choose to plant and find ways to minimize the issue.
Agenda for today

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• **Grazing plan for cover crops**
• Crop Residues
• Last Thoughts
STOCKING RATE CALCULATIONS FORAGE/ANIMAL BALANCE

Proper Stocking Rate (Number of Head) = Carrying Capacity

Total Annual Forage Production × Harvest Efficiency

Average Daily Intake × Length of Grazing Season

Substitute Number of Head to solve for Number of Days

Forage Available

Animal Demand

Grazing Goal
STOCKING RATE CALCULATIONS FORAGE/ANIMAL BALANCE

Carrying Capacity

Total Annual Forage Production × Harvest Efficiency

Average Daily Intake × Length of Grazing Season

Variable

25%-35%

2.5-3% of BW

1000 lbs x 3% = 30 lbs/day (Animal Unit Day (AUD))

Consider 45-75 days
Stocking Rate

Forage Inventory - Harvest Efficiency

- Carrying Capacity
- Total Annual Forage Production
- Average Daily Intake
- Length of Grazing Season
- Harvest Efficiency

Total Forage Production
- 25% Available for Grazing Animal
- (Available Forage Production)
- 25% Environmental Loss
- Trampling, Grazing Selection, Manure/Urine Spots, Insects, etc.

50% Remains for Grass Plant Health/Vigor
## Forage Production in Native Range

<table>
<thead>
<tr>
<th>Rangeland Type</th>
<th>Low Density lb/ac/\text{inch}</th>
<th>Medium Density lb/ac/\text{inch}</th>
<th>High Density lb/ac/\text{inch}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tallgrass</td>
<td>120-160</td>
<td>160-230</td>
<td>230-300</td>
</tr>
<tr>
<td>Mixed grass</td>
<td>70-120</td>
<td>120-160</td>
<td>160-230</td>
</tr>
<tr>
<td>Shortgrass</td>
<td>30-40</td>
<td>40-80</td>
<td>80-120</td>
</tr>
</tbody>
</table>
Forage Production Estimates

- Fall seeded oats: 100-120 lbs/in of height
- Fall seeded grass/brassica blend: 180-220 lbs/in of height
- Fall seeded rye/wheat: 275-350 lbs/in of height
- Summer grazing blend (forage sorghum, sudangrass, etc.): 1,000-1,200 lbs/foot of height (85-100 lbs/in of height)

**Good Stand? Or Fair, or Poor?**
Grazing Cover Crops

- What’s the Goal?

Is it a **cover** crop that will be **grazed**?

OR

Is it a **grazing** crop that will provide **cover**?
HARVEST EFFICIENCY:

What is the goal?
Harvest Efficiency:

Portable Electric Fencing
- Allocate forage over time to reduce waste.

Water Development
- Keep travel distances to a minimum.

Figure 1. Impact of distance from water on temporal utilization rate in rectangular 10-acre paddocks.
Take Home

• Forage production using annual forages can be highly variable. Have perennial pasture or stored feed available as a backup plan.

• Determine a cover goal (harvest efficiency) before grazing and stick to the plan.

• Use basic forage estimates to provide a starting point for grazing expectations. Keep records each year, and fine tune future plans.
Agenda For Today

What is the perfect cover crop?
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Last Thoughts
Beef.unl.edu  corn stalk grazing calculator
ARE STALKS A Viable Feed Option for Cattle?

Low cost feed option ($10/ac)
CP: 5-8%
TDN: 40-70%
Quality is higher in dryland corn than irrigated

Requirements for a 1400 lb dry cow in last trimester
- CP: 6.9 – 8.9%
- TDN: 49.1-56.6%
Cows prefer grain, husks, leaves in that order

K-State Forage Facts Grazing corn Residue
KANSAS STATISTICS

5.30 million acres – corn for all purposes
5.15 million acres – corn for grain

State carrying capacity for cows assuming:
  – 1400 lb dry cow
  – Utilizes 50% of stalks
  – Average corn yield in KS 142 bu/ac (KSCC, 2016)
  – Graze for 90 d
  – Stocking rate 1 cow/3 ac

1,716,666 cow ~ 1.7 million cows
1.6 million cows in KS → 6.4 million cows+calves (NASS, 2017)
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Midwest Cover Crops Field Guide (book)
Midwest Cover Crops Council - Cover Crop Decision Tool

http://mccc.msu.edu/covercroptool/covercroptool.php
K-State “Cover Crop Species and Mixtures”

S 115 Forage Facts Notebook

MF 2086 Managing KS Grazinglands for Multiple Benefits
MF3443 Managing Spring Planted Cover Crops for Livestock Grazing under Dryland Conditions in the High Plains Region - KSRE Bookstore

https://www.drylandag.org/uploads/1/1/5/7/11576673/carrying_capacity_calculator.xlsx
Spread out attractants – water, feed, mineral, shade shelter
One ounce of grass

1 oz = 1 bite for a cow
1 oz per sq. yd adds 302.5 lb per acre
193,000 lbs per section
$$ MILLIONS $$ to state of Kansas