Adding Warm Season Grasses

Forage Growth Rate

Warm Season Grass

Feb Apr Jun Aug Oct Dec
# Growth Curves of Various Grasses

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<td>Switchgrass</td>
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<tr>
<td>Big bluestem</td>
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<tr>
<td>Indiangrass</td>
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Forage production levels
## Optimum Growth - Temperature

<table>
<thead>
<tr>
<th>Forage Type</th>
<th>Optimum Growing Temperature (°F)</th>
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<tbody>
<tr>
<td>Cool season grasses</td>
<td>60 – 80</td>
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<tr>
<td>Legumes</td>
<td>70 – 90</td>
</tr>
<tr>
<td>Warm season grasses</td>
<td>80 – 95</td>
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</tbody>
</table>
Benefits of Warm Season Grasses?

- Good summer production
- Helps manage fescue endophyte problem
- Helps manage spring growth of cool seasons
- Favorable haying weather
- Adapted/persistent
- More efficient users of H2O & N than cool season grasses
- Wildlife benefits (NWSG)
- Good quality and animal performance
- 38 % higher season long ADG when WSG included in summer grazing as compared to tall fescue full season
Predominant Warm Season Grasses in the Midwest

• Native WSG
  – Big Bluestem
  – Indiangrass
  – Switchgrass
  – Eastern Gamagrass
  – Others
    • little bluestem
    • sideoats grama
    • dropseeds

• Introduced WSG
  – Bermudagrass
    • common types
      – Guymon,
      Wrangler, Cheyenne
    • hybrids
      – Hardie, Tifton 44,
      Midland, Midland 99,
      Ozark, others
  – Old World Bluestems
    • Caucasian
    • Plains
    • WW Spar
    • King Ranch
Warm Season Grasses in the Midwest

• Native WSG
  – Provide wildlife habitat
  – Well adapted
  – Require longer rest periods + height
  – Require moderate levels of N
  – More cost-share opportunities
  – Less sensitive to climate
  – Deeper rooted

• Introduced WSG
  – Provide good late summer forage
  – Higher stocking rates
  – Need shorter rest periods & height
  – Require high levels of N to meet yield goals
  – May invade native grasslands?
  – More sensitive to climate
Introduced Warm Season Grasses

- Tall Fescue
- Bermudagrass
- Caucasian Bluestem
Bermudagrass

- Warm-season grass
- Rhizomes & stolons
- Challenge to establish
- Winter hardiness issue
- Requires high fertility
Caucasian Bluestem

- Quick establishment
- Grows on poor soils but responds well to fertility
- Able to withstand close and frequent grazing
Native Warm-Season Grasses

Forage Yield

Cool Season Grass

Switchgrass

Big Bluestem

Indiangrass

Eastern Gamagrass

Feb Apr Jun Aug Oct Dec
Switchgrass

• Earliest of the Native Warm Season Grass (too early?)
• Often ready for grazing before the cool season grasses have stopped producing.
• Well adapted to wetter sites
• Aggressive - Competitive
Eastern Gamagrass

- 85% of growth between May 15 & August 31
- Tolerates wet soils
- Highly palatable
  - “ice cream grass”
- Easily overgrazed
- Yields 5 to 10 tons reported
- Poor seed production & germination
- Establishment difficult
Big Bluestem

- Main growth
  - Late June – Early Sept
- Drought tolerant
- High quality
- High palatability
- Good production timing for our area
Indiangrass

- A late producer - 1-2 weeks later than Big Bluestem
- Lower yielding
- Good mix with Big Bluestem
- High palatability
- Not good on wet sites
- Good winter hardiness and drought tolerance
A mixed stand of Indiangrass and Big Bluestem during July in Kentucky
Native Warm Season Grasses

Big Bluestem

Indiangrass

Switchgrass

Eastern Gamagrass
Caucasian Bluestem

Bermudagrass
## Warm Season Grass Adaptability

<table>
<thead>
<tr>
<th>Species</th>
<th>Yield</th>
<th>Tolerance to poor drainage</th>
<th>Tolerance to low fertility</th>
<th>Drought tolerance</th>
<th>Heat tolerance</th>
<th>Cold hardiness</th>
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<tbody>
<tr>
<td>Bermuda Grass</td>
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<td>Old World Bluestem</td>
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<td>Indian Grass</td>
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<td>17.79</td>
<td>66.74</td>
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Establishment

- Cultivation
- Interim Crops
- Seeding
  - Dormant
  - Spring
- Weed Control
- Harvesting
Fertilize Soil

- Soil test pH, P, K, Ca, Mg
- Lime 6 months ahead – split application if over 5 tons per acre are needed.
Weed Control

• Rotations –
  – Interim (Smother) Crop

• Management
  – Cutting, Fertilization

• Chemicals
  – Preplant before planting
  – Preemergence as one plants
  – Post emergence after crop is emerged
Chemicals

• Post Emergent Herbicides
  – 2,4 D  Kills broadleaf weeds NOT Grasses
  – 2,4 DB  Kills broadleaf and Grasses but NOT Legumes
    • Ester – is in oil base so faster to enter leaf therefore is recommended at a lower rate than
    • Amine – is in a water base – slower and easier to wash off of the waxy leaf surface
First Year After Seeding

- 2375 pounds of hay per acre was cut
- 2298 pounds of forage was grazed per acre
- 4635 total pounds of production
Prescribed Burning
Grazing Management

- As a rule of thumb, take half and leave half.
- Minimum grazing height on warm season grasses is 6 to 8 inches.
How Grasses Grow

- 95% of plant nutrients come from the atmosphere
  - (C, H, O)

- 5% of plant nutrients come from the soil
  - (N, K, Ca, P, Mg, S, Cl, Fe, Mo, Zn, B, Cu)
The Root System is Almost a Mirror Image of the Top Growth

*Short, weak plants = short, weak roots*
Native WSG Species

GRAZE AND REST PASTURE

12 - 16”

4 - 6”
Introduced WSG Species

GRAZE AND REST PASTURE

4 - 6”

2 - 3”
Grazing Management
Fertility

- Soil test regularly to monitor needed fertility
- Apply what soil tests call for on P and K
- 40 to 60 lbs of N
<table>
<thead>
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<th>Date</th>
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<th>DOM</th>
<th>Animal Perf.</th>
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<tr>
<td>6/2</td>
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# Indiangrass

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<td>7/11</td>
<td>16.71</td>
<td>71.19</td>
<td>5.234</td>
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Considerations for Natives

- Animal performance has been averaging between 2.00 to 2.30 pounds of gain per day with no outside supplement.
- All animals are off natives by mid-August:
  - Accumulates fuel for fire
  - Animal performance drops below 2.00 pounds of gain per day
Caucasian Bluestem

<table>
<thead>
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<td>4.546</td>
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<tr>
<td>6/11</td>
<td>17.79</td>
<td>70.82</td>
<td>4.986</td>
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Annual Lespedeza

- Summer annual
- Increase forage quality
- Legume component lowers fertility needs
Possible Forage System for a 365 Day Grazing Season
So...Is 365 Days of Grazing Possible?

- It Depends – possible with good planning, intensive management and favorable weather
- Variations in weather make it more difficult some years
- Might not always be the most cost effective
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